BRITISH MEDICAL JOURNAL

LONDON: SATURDAY, SEPTEMBER 21st, 1935

PINK DISEASE*

BY

A. JEFFREYS WOOD, M.D.MELB.

HONORARY CONSULTING PHYSICIAN, CHILDREN'S HOSPITAL, MELBOURNE

AND

IAN WOOD, M.D.MELB., M.R.C.P.LOND.

HONORARY PHYSICIAN TO OUT-PATIENTS, CHILDREN'S HOSPITAL, MELBOURNE; ASSOCIATE ASSISTANT, ROYAL MELBOURNE HOSPITAL

Pink disease has been known to man for less than half a century, and physicians of many lands have striven to solve the mystery of its causation and cure. So far but little light has been shed on the obscurity of this distressing malady.

The name "pink disease" has been adopted for this paper as it is non-committal so far as the cause of the malady is concerned, and, connoting as it does one outstanding feature, the pink rash, it is easily understood, and thereby leads to the diagnosis of many cases that might otherwise pass undetected. Also this name has been adopted by common consent throughout the British Empire. In America the disease is known as "infantile acrodynia."

Historical

Rocaz[1] of Bordeaux has recently drawn attention to an excellent description of pink disease by Selter[2] of Solingen, the Ruhr, which was published as far back as 1903. At a congress in Cassel this German physician related his observations on a new disease, the report of the congress appearing as follows:

> Herr Selter (Solingen) reported eight cases of an illness for which he found no analogy in literature and which he termed "trophodermatoneurosis." The malady occurred in girls of 1½ to 3½ years. It was of gradual onset, and manifested itself in loss of interest, nervousness, and progressive loss of speech. Other features were delirium in sleep, mental disturbances (hallucinations, coprophagy), and profuse sweating with its consequences (sudamina, eczema, and sodden skin). The hands and feet were swollen, reddened, and cold. The patients had a constant sense of coldness and itchiness, and there was a loss of hair (mostly temporal) sometimes amounting to complete baldness. As clearly secondary phenomena, paronychia and boils appeared. The internal organs showed no abnormalities. The illness ended favourably in all cases in weeks or months.

This must undoubtedly be accepted as the first authentic description of pink disease. Unfortunately no one present recognized the condition, and so this important communication remained hidden in the obscurity of a medical journal until Swift[3] of Adelaide restated the syndrome, which he called "erythroedema." Swift's contribution was read at Auckland, New Zealand, in 1914, and was based on the study of fourteen cases. One of us (A. J. W.), a former student of William Snowball, was present, and in conjunction with Hobill Cole an immediate start was made to collect cases in Melbourne, Victoria. By the time the next Australasian Medical Congress met at Brisbane, in 1920, it was possible to review the signs, symptoms, prognosis, and treatment of ninety-one cases.[4] About 150 cases have now been personally studied in private practice by one of us (A. J. W.), and these form the basis for discussion in this paper. The biochemical changes in pink disease are not included, but will be reported later. As far as Australia is concerned this is not a new disease, for during the past fifty years it has been recognized by medical men specializing in diseases of children in Melbourne and Sydney. In 1883 William Snowball of Melbourne pointed out to his students a child with what he described as "raw beef hands and feet." He thought that this condition followed an attack of gastro-enteritis, and after a prolonged course recovery took place.

At about the same time Charles Clubbe of Sydney also recognized the malady, and called it "pink disease," from the sudaminal rash that was usually present. When asked whether he had invented the name he wrote: "I have always called these cases 'pink disease,' but I do not know if I originated the name."

Being certain that cases of pink disease existed before 1914, when Swift's paper was read, a search was recently made through the records of private cases belonging to one of us (A. J. W.). Three typical cases were quickly found between 1898 and 1901, and the first one is summarized here as being one of the earliest Australian case records of the disease:

> K. B., a female aged 12 months, was first seen on September 21st, 1898. She had been ill for seven weeks, and a diagnosis of influenza made. Her gums had been lanced. She was sweating freely and was weak, being unable to sit up properly. Two months previously she had been able to walk. She was irritable about the body and legs, and the buttocks were ulcerated. Her toes were red and "beefy-looking," with vesicles on the soles of the feet, which had been scratched. She was treated with a mercurial binder and eventually recovered.

Swift, in a personal communication, says that he saw cases of pink disease when he was a house-physician at Great Ormond Street Children's Hospital, London, in 1885. In 1914 when again in London he discussed the disease with Still and Garrod, who both agreed that they recognized the syndrome, but could not help with regard to the causation or pathology. They both confessed that they knew of no literature on the subject.

* Read in opening a discussion in the Section of Diseases of Children at the Annual Meeting of the British Medical Association, Melbourne, 1935.

Aetiology and Pathology

Pink disease attacks males and females in practically equal numbers, and does not occur in definite epidemics. One of the features of the disease is that it occurs in young children, the majority being between 9 and 18 months of age (Fig. 1). We have seen over 200 cases in Australia, and they have all been under 4 years of age. This makes us wonder if the affection does occur here in older children, as reported in other countries, especially in France.[1]

It is of great interest to consider the site, nature, and causation of the pathological changes which occur in pink disease. In recent years the attention of many authorities has been focused upon the nervous system. Blackfan and McKhann[5] have discussed the role played by the various parts of this system, and have shown how many of the signs and symptoms of pink disease could be produced by its disordered function. They have again stressed the importance of the sympathetic system, as was originally suggested by Feer in his early work on the disease. The post-mortem results, which have recently been reviewed by Cobb,[6] show that although there may be microscopical changes in practically any portion of the central nervous system, these findings are variable, and usually of a minor degree. Briefly, it may be stated that on various occasions the following changes have been noted: round-cell infiltration, demyelinization, cellular degeneration, and oedema in the spinal cord, and degenerative changes with demyelinization in the peripheral nerves. Wolf, Paterson, and Davison[7] have made interesting observations on the brain, showing changes in the cerebrum and cerebellum. These writers state that many of these changes could be produced by starvation and exhaustion alone. This hypothesis was further borne out by animal experiments.

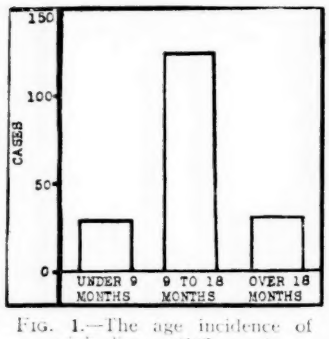


FIG. 1.—The age incidence of pink disease (192 cases).

In reviewing the post-mortem findings in his three cases, Blackfan also concluded that the microscopical changes in the central nervous system were no more extensive than could be accounted for by the terminal infections from which the patients died. It seems that the pathology of pink disease is the pathology of its complications.

It is of importance to realize that prior to death all the organs, including the various components of the nervous system, have usually been subjected to the toxins liberated from three sources: first the toxin of pink disease *per se*, secondly the various coccal infections of the skin, mouth, etc., and thirdly the superadded disease which usually terminates life, such as pneumonia or gastro-enteritis. To these toxic products the harmful effects of prolonged under-nutrition must be added.

As nearly every organ in the body is controlled either directly or indirectly by the central nervous system, and especially by the sympathetic system, it is a simple matter to postulate that the primary lesion lies in that situation. It should be remembered, however, that no matter where a toxin may originate in the body, it will inevitably gain access to the blood stream and so bathe every organ. Thus if there is a widespread upset in bodily function, as seen in pink disease, it is just as rational to conclude that the organs themselves have been attacked by some toxin, and that the influence of a deranged sympathetic system plays but a minor part. The organs have a common blood supply as well as a common nerve supply. At present we prefer to maintain an open mind as to the site of attack of the noxious influence, and would rather visualize it as a toxin which is diffusely distributed throughout the body, rather than acting entirely through the medium of the nervous system.

Theory of Causation

The cause of pink disease is not known. There are many theories, however, and some of the more interesting ones have been selected for discussion.

Vitamin Deficiency.—The post-mortem changes in the nervous system are often in keeping with this theory, and the disease tends to occur at an age when vitamin deficiency is most common. On the other hand, pink disease may develop in a child who is receiving a liberal supply of the known vitamins, and also large amounts of these vitamins do not produce the cure, although they assist in maintaining bodily health. Moreover, compared with other lands, pink disease is relatively common in Australia, yet the standard of living here is high and vitamin deficiency is rare.

Light Hypersensitivity.—Braithwaite[8] considers that pink disease may be due to an abnormal reaction to daylight following on a recent infection, and this might explain the prevalence of pink disease in Australia. Improvement is claimed by keeping the children in a light from which the rays from the violet end of the spectrum have been filtered by means of ruby glass. We do not subscribe to this theory for several reasons. We consider that children who are nursed in the open air do not run a prolonged course. They usually tend to recover more rapidly and are less prone to secondary infection than the children who are nursed indoors. Even more convincing is the fact that graded sun baths with tanning of the skin have been most beneficial in a number of cases. In no case did the rays of the sun appear to be definitely detrimental to the course of the disease, although it must

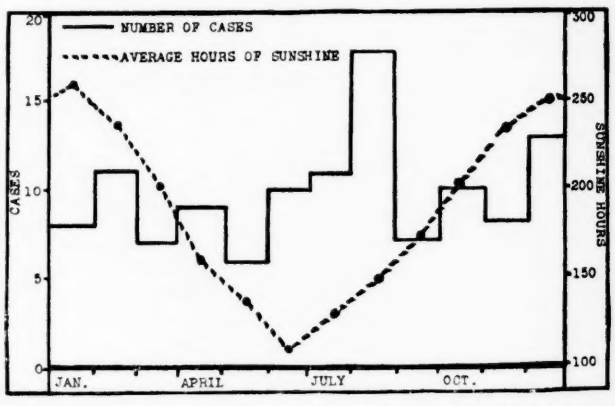


FIG. 2.—An increase in the average hours of sunshine does not produce more cases of pink disease (analysis of 116 cases).

be admitted that several children were rendered most uncomfortable by exposure to the sun. Finally an analysis of 116 cases failed to show that the greatest number occurred at the time of the year when the hours of sunshine were at a maximum (Fig. 2).

Infection.—An attempt was made in Victoria by Penfold, Butler, and one of us (I. J. W.)[9] to determine an infective factor in the aetiology of pink disease by a study of blood cultures, but it was felt that the results obtained were not conclusive. Although world-wide efforts have been made to prove an infection as being the cause of the disease, the results have been negative except in a few isolated and unconfirmed experiments. Moreover, the histological changes in the organs do not

as a rule indicate bacterial invasion, except where there has been a definite superadded infection.

A great deal of indirect evidence is available, however, which suggests either a passing bacterial invasion leaving a trail of chronically disordered body function, or else a prolonged mild infection which has evoked but little reaction. Many writers have stated that the onset of the disease is significant. In the present series 116 cases were studied with reference to this, and 24 per cent. were found to have had a febrile attack at the onset. The temperature rose to 100° or 102° F., and was usually accompanied by upper respiratory infections. Further, during the course of pink disease, the rectal temperature often shows slight elevations to 100° F. in the absence of secondary infection.

The history of direct contact as a possible cause of transmission has been recorded on several occasions. In the present series 140 cases were especially investigated from this standpoint, and four families were found where a second child was attacked by the disease, but only after the long intervals of fifteen months, three years, four years, and six years respectively. On another occasion a child who was taken to visit a baby with pink disease contracted the malady one month later. These figures may be of some significance, as pink disease is uncommon in Victoria when compared with other maladies.

The age incidence of the disease is in keeping with the infectious theory when an analogy is drawn to diseases such as measles and diphtheria, where towards the end of the first year and during the second year of life the immunity conferred *in utero* is lost. Adults do not contract pink disease, so it is rational to suggest that the mother possesses immunity and conveys it to the developing foetus. When the baby nears the end of the first year of life this immunity wanes and he becomes susceptible.

The infecting organism may be a virus which is widely spread throughout the community in a non-pathogenic state. These carriers would perhaps react slightly to the virus from time to time, and thus immune bodies would be produced. On rare occasions the organism would assume a pathogenic role in a highly susceptible individual, usually a child aged between 8 and 18 months, and an attack of pink disease would result. This theory would explain the infrequency of transmission by direct contact, and also the occurrence of sporadic cases in isolated parts of Australia.

Symptomatology

When discussing the symptomatology of a disease it is satisfactory to be able to correlate the clinical findings with the pathology of the condition. Unfortunately with pink disease this attempt is immediately doomed to failure, for the causation and the pathology still remain practically a closed book. As many excellent discussions of the disease are available in literature it will suffice to discuss but a few points of special interest.

In reviewing the case histories recorded by one of us (A. J. W.) during the past twenty years we have made a study of the onset, course, and duration of pink disease. Formerly various symptoms have been unduly stressed, and this has resulted in many cases being misdiagnosed during the early stages of the malady. This especially applies to the presence of the pink coloration of the hands and feet. An analysis of fifty-seven consecutive cases showed that the average time for the appearance of this symptom was the fifth week of the disease. Although it occurred in the initial stage in twelve of the cases, it is interesting to note that in five cases it did not appear until the third month. Several authentic cases have been recorded where the pinkness has not appeared at any stage.[1]

Three Clinical Phases

The symptoms of pink disease could well be divided into three stages, the first two each lasting one month and the third much longer.

First Stage.—During the first few days there may possibly be an acute phase consisting of coryza, a temperature varying from 100° to 102°, and general malaise. During the rest of the month the patient becomes irritable and sleep is greatly disturbed. The entire mental make-up of the child is distorted. He becomes petulant, vicious, and extremely miserable, as is illustrated by the following case records:

N. C., a female aged 15 months, was seen on October 1st, 1921. For the past two months she had been developing the classical signs of pink disease with red, swollen, and icy-cold hands and feet, anorexia, loss of weight, and intense pruritus. The mother stated that for the past six weeks she had been up practically the whole night trying to pacify the child, who rarely slept for more than two hours. She also stated that if her child had been an adult, she would have been considered to be insane, sitting up in her cot, banging her head with her hands, tearing out her hair, screaming, and viciously scratching anyone who came near.

The appetite soon begins to wane, the weight falls, and there is great muscular weakness. This loss of power is a constant early finding, and deeply impresses the parents when their children are old enough to walk. During the infantile paralysis epidemic in Victoria in 1930 several cases of pink disease were sent to the Children's Hospital erroneously diagnosed as infantile paralysis on account of this muscular weakness. Towards the end of the first month the sudaminal rash may appear on the trunk, and is most prominent during the bouts of profuse sweating which so commonly occur. The miserable child begins to turn from the light and assumes the characteristic attitudes which are caused by the hypotonia, photophobia, and itchiness of the face, arms, and legs. The intense itching of the skin has actually been described by some of the older patients,[1] and when the younger children are closely observed the great distress produced by this symptom can be fully appreciated. They slowly twist and turn, rubbing and scratching the offending parts either with their hands or against the sides of the cot.

Second Stage.—During the second stage, which also lasts about one month, the various changes become fully established, and the child develops the classical picture of pink disease. The hands and feet are swollen, and either pink or slightly cyanosed, depending on the surrounding temperature. They feel icy cold, and the circulation is poor, for if the superficial capillaries are emptied by pressure on the skin the refilling is slow when the pressure is released. The vesicles which appear in the skin of the hands and feet break and then desquamate. Here staphylococcal infections frequently appear. Photophobia without apparent conjunctivitis, a rapid pulse and often a raised blood pressure, a running nose and excess salivation, severe bouts of sweating, a sudaminal rash on the trunk, marked muscular weakness and hypotonia, trophic changes and secondary infections, especially in the skin and mouth, and invariably a change in the mental attitude complete the distressing syndrome. Perhaps it is only now that the pinkness of the hands and feet appears for the first time and the correct diagnosis is made.

Third Stage.—This stage of gradual recovery begins in the third month and lasts for several months. There is a natural tendency for the great majority of cases of pink disease to improve in the third month, irrespective of the type of treatment. An analysis of sixty-two consecutive cases showed that the average duration before improvement set in was twelve weeks. This was prolonged by any severe secondary infection, notably stomatitis,

bronchopneumonia, gastro-enteritis, and skin infections. The first indications of improvement are usually an increase in appetite and sleep, and the weight no longer falls. The child becomes tolerant and peaceful instead of being miserable and antagonistic. He gradually regains his power and takes an interest in his surroundings. He may even smile. It is many weeks, however, before he is finally restored to normal health. An analysis of twenty-one consecutive cases showed that the average time which elapsed between the onset and complete recovery was seven months. The longest duration was eighteen months. The hypotonia is the last symptom to disappear, and we know of no children who have suffered from any sequelae.

Treatment

Specific.—Until the cause of pink disease is found it will be difficult to obtain a specific remedy. Before such a cure can be accepted it will have to ensure that the duration of pink disease must be consistently reduced to six weeks or less instead of the usual twelve or more weeks. Pink disease shows a natural tendency to improve during the third month, and yet this improvement is constantly being claimed as being due to some new form of treatment. It appears that up to the present no successful specific method of treatment has been fully established.

Symptomatic.—Although the course of pink disease cannot be greatly altered it is possible to lessen the discomfort of the sufferers, and to alleviate the mental and physical stress which falls to the lot of parents. In addition, the incidence of secondary infection can be reduced considerably. Treatment in the open air is of the greatest value, and if possible the children should sleep on open balconies. Most patients will be aided if their skins are well tanned by graded sun baths. If it is necessary to send cases of pink disease to a hospital it is wise to see that there is accommodation for them on the balconies and in the gardens, as they do not do so well in the wards with other ill children. Next to treatment in the open air emphasis should be laid upon the comfort gained by seeing that the body is lightly clad both by day and by night. This may best be shown by the following case:

R. L., male aged 18 months, was seen on October 12th, 1934. He was well up to four weeks before consultation, when he began to lie about with his face downwards and did not want to eat. His sleep had been very broken for three weeks and he had lost weight. At the same time he ceased to walk and his muscles became very soft. He sweated at intervals during the day and pulled out his hair in handfuls. He cried constantly day and night. The hands had been red and swollen for the past fourteen days, and a red rash was present on the trunk. When brought to the consulting room he was crying and throwing himself about, apparently as if he could not get comfortable. His pitiful wailing and look of distress lasted without intermission for twenty minutes. The child was wearing a knitted woollen pullover, a silk shirt, and a woollen Jaeger undershirt, a napkin, silk pants, and a pair of socks. For examination he was stripped, and lying naked he immediately went to sleep, and all through the examination slept peacefully. He was then dressed to go home in the silk shirt and the napkin. The shirt had short sleeves so that his neck, arms, and legs were bare, and thus covered he continued to sleep all the way home. Later, when he was thoroughly convalescent, his father stated that the least possible clothing had afforded the greatest relief. The child wore only a silk singlet and napkin except when the weather was very cold, when he wore a loose woollen garment in addition.

Clothing.—A sleeveless mercerized cotton singlet and napkin were all the clothes others wore all through their illness. Silk next to the skin is infinitely more comfortable than wool, especially when the skin is sweating freely. It has been shown experimentally that silk has a greater absorbing power than wool.[10] Cotton is next in preference to silk. Cases of pink disease are also more comfortable at night when lightly clad. Hospital nurses state that these children resent being tucked into bed at night, and immediately commence to crawl slowly out on top of the bed coverings. No matter how often the night nurse repeats the tucking-in process, out they crawl.

Local Applications.—The next factor in the child's comfort is a tepid bath given night and morning, and after careful drying with a soft sterile towel the skin of the whole body is gently rubbed with methylated spirit. This is followed by a liberal dusting with a talc or zinc and starch powder. If any irritation is present about the fingers and toes, painting them with equal parts of tincture of iodine and methylated spirit after the bath will prevent onychia. After these baths the patients are comfortable, and usually obtain two or three hours of sleep. The methylated spirit application undoubtedly keeps the moist perspiring skin free from coccal infections, and since adopting this treatment the ulceration of the buttocks, multiple pustules about the trunk and limbs, and loss of nails have been rarely seen. These are very serious complications, even causing death in some cases. Infections of the mouth are also very serious, so careful attention to the fingers, which are frequently in the child's mouth, is an essential point in the treatment. The mouth can be kept fairly sterile by letting the child chew on a swab of cotton-wool fastened in sterile gauze moistened with peroxide of hydrogen one part to four of water. The children seem to enjoy chewing this swab, which is controlled by a silk thread. It certainly does seem to lessen the incidence of stomatitis with loss of teeth, and helps to heal the ulcers that so commonly appear in the course of the disease. Chromic acid solution 1 per cent. may be used for obstinate ulcers. The irritable hands are best left exposed to the air, as any attempt to keep them warm seems to increase the discomfort. Wiping with spirit and fanning them makes them comfortable, and occasionally older children seek relief by immersing them in cold water. Gentle stroking or rubbing the hands and feet also seems to soothe the child.

General Care.—Nursing these children in the mother's arms only increases the heat of the body, so that the perambulator or cot is the best place for them to lie. They also seem to sleep better when the perambulator is being wheeled, so taking them for walks seems to be beneficial. During the first six weeks children with pink disease are ill and do not want to be amused. Parents should be warned not to allow the other children of the family to worry them, or encourage visitors to come and "cheer them up."

Diet.—Owing to the thirst that is such a prominent feature, milk will usually be taken in fairly liberal quantities. Under ideal conditions for preservation and sterility, cold unboiled cow's milk may be given with advantage. Otherwise one of the common modifications of milk may be used and vitamins added in generous quantities. Cocoa is appreciated by older children, and raw eggs may be mixed with the milk. Raw liver and meat juices have been highly recommended, and have been advocated as a possible specific cure,[11] [12] but apart from their high nutritive contents, which include protein, vitamins, and iron, we do not consider that they have any specific value. Children under 2 years of age show a great dislike for the solid foods which they have previously taken well, so every effort should be made to maintain a well-balanced diet by the addition of eggs and broths to the milk diet. Some children seem to enjoy raw vegetables, such as lettuce, and also raw fruits of all kinds, and

these may be given with advantage. The following letter from the parent of a child aged 18 months is instructive:

"A. lived on raw fruits, showing a marked preference for this kind of food. Lettuce leaves played a large part in his diet. Milk was given unboiled and cold, and he drank a quart daily. His appetite was poor at all times, but he would always eat raw fruit, and never objected to a drink of milk. The demand for repeated drinks was noticeable throughout his illness."

When the mouth is ulcerated cold foods will prove to be less painful than hot. A change from the city surroundings to the mountains or seaside is of the greatest benefit when the children begin to sleep better and their appetite improves. It should be emphasized, however, that during the worst months of the illness the parents are well advised to keep their children away from strangers and strange places. The resources of a nurse trained in the care of ill children are of great help if the anorexia is extreme. In some cases it may even be necessary to resort to tube feeding.

Drugs.—For insomnia occasionally a mixture containing bromides and chloral hydrate has been of help, but hypnotics are usually disappointing.

Prognosis

Under ideal conditions the mortality is low, most patients being restored to perfect health. Relapses are rare once the child begins to eat and sleep well and put on weight. Sequelae are unknown, and one attack apparently affords a permanent immunity. The complications that may appear during the prolonged course of this disease comprise the chief danger to life, although on rare occasions sudden death may unexpectedly occur in the absence of any obvious superadded condition. When the patients are treated in hospital wards cross infections such as bronchopneumonia and gastro-enteritis are especially liable to occur, in spite of careful nursing. Fig. 3 shows the grave danger to life which is incurred by admitting cases of pink disease to a public hospital, where the nursing is excellent but the risk of cross infection is always present. The treatment in both groups was practically uniform, but it must be admitted that the hospital group would naturally contain a higher percentage of severe cases. However, we consider that by diminishing the secondary infections of the skin and mouth, removing all possible sources of cross infection, and giving a well-balanced diet and plenty of fresh air the mortality rate of pink disease should be less than 5 per cent.

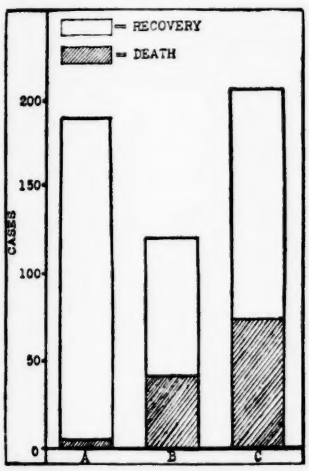


FIG. 3.—When cases of pink disease are treated in their own homes (A) the mortality is low (3 per cent.) compared with the results of hospital treatment both in Melbourne (B) (mortality 30 per cent.) and in Sydney (C) (mortality 29 per cent.).

The length of the illness should be impressed upon the parent when the case is first diagnosed, otherwise the patient will pass from one medical attendant to another. After three or four months the child will be finally "cured" by some form of treatment which, if used at the beginning of the illness, would have failed to shorten the attack.

Summary

1. The early work on pink disease is described, and honour is paid to Selter.

2. The aetiology and pathology is discussed, with special reference to the part played by infection.

3. The symptomatology is described and the natural course of the disease is emphasized.

4. It is considered that no specific method of treatment has yet been established, but great benefit is obtained by attention to the details of symptomatic treatment.

5. The great danger of cross infection is stressed.

Our thanks are due to Dr. Reginald Webster, pathologist at the Children's Hospital, Melbourne, for his constructive criticism of this paper.

REFERENCES

1 Rocaz: *Pink Disease* (Martin Hopkinson, translated by I. J. Wood), London, 1933
2 Selter: *Arch. f. Kinderheilk.*, 1903, xxxvii, 468.
3 Swift: *Transactions*, Tenth Session Australasian Medical Congress, Auckland, 1914, p. 547.
4 Wood, A. J.: *Med. Journ. of Australia*, February 19th, 1921, p. 145.
5 Blacklan and McKhann: *Journ. of Pediat.*, 1923, iii, 44.
6 Cobb: *Amer. Journ. Dis. Child.*, 1933, xlvi, 1076.
7 Wolf, Paterson, and Davison: *Journ. of Pediat.*, 1934, iv, 498.
8 Braithwaite: *Arch. Dis. in Child.*, 1933, viii, 1.
9 Penfold, Butler, and Wood, I. J.: *Med. Journ. of Australia*, July 30th, 1932, p. 127.
10 Faber and Hadden: *Arch. of Pediat.*, 1926, xliii, 283.
11 Whyllie and Stern: *Arch. Dis. in Child.*, 1931, vi, 137.
12 McDonald: *Med. Journ. of Australia*, August 26th, 1933, p. 276.

PREVENTION AND PROGNOSIS OF THE LATE TOXAEMIAS OF PREGNANCY*

BY

JOHN S. FAIRBAIRN, M.A., B.M., B.CH.OXON, F.R.C.P., F.R.C.S., P.C.O.G.

CONSULTING OBSTETRIC PHYSICIAN, ST. THOMAS'S AND GENERAL LYING-IN HOSPITALS

Definitions and Preliminary Observations

The "late" toxaemic manifestations exclude those arising before the twenty-eighth week, thus partially overcoming the difficulty of differentiating them from cases of chronic nephritis complicating pregnancy, in the large majority of which symptoms will have arisen earlier. It is not, however, so simple a matter to lay down what is or is not implied under the designation of the "toxaemias of pregnancy," as they form a group of disorders whose right to such a title, though justified on pathological grounds, has never been proved by the discovery of any definite toxin or toxins. Hence dependence for a definition of the conditions under consideration must be placed on their clinical features, of which a true albuminuria and raised blood pressure are the most consistently present. Associated therewith are others, such as oedema, headache, vomiting, insomnia, cramps, polyneuritis, jaundice, and ante-partum bleeding, in varying degrees of prominence and frequency. No useful purpose will be served by trying to do more than offer a syndrome of this kind for a well-recognized group of disorders, but the need for a period of observation before cases can be definitely placed in this category must be stressed. Albuminuria, for instance, even of proved renal origin, may mean much or little, and sometimes is late in appearance or even absent. I accept F. J. Browne's[1] conclusion, based on an analysis of 320 cases of so-called "pre-eclampsia," that the cause, whatever it may be, is capable of producing directly any one of the signs or symptoms ascribed to the condition.

* Read in opening a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Melbourne, 1935.

Prevention

Constructive Hygiene.—Ante-natal supervision being primarily a system of constructive hygiene, the crucial question in this part of our discussion is to determine how far it is possible to formulate a special hygiene for the expectant mother that may lessen the incidence of these conditions. Owing to our ignorance of their causal factors, a rational basis for a physiological system of this kind is lacking. In 1922 the physiological requirements of the pregnant woman were thus summarized by Marshall[2]: "The dietary conditions which must be observed more particularly are an abundant supply of, first carbohydrates, secondly calcium, and thirdly vitamins." This statement expresses the focal point round which discussion revolves to-day, for dietary systems occupy the most prominent place in prophylaxis. Claims are advanced for fruitarian, flesh-free, and salt-free[3] diets, for a high vitamin content and additional supplies of certain mineral salts, such as those of calcium, phosphorus, iodine, and iron, but based more on theories of the cause of the disorders they are intended to avoid than proof of their efficacy by clinical observation. An unintentional trial on large numbers showed a pronounced fall in the eclampsia rate among the half-starved populations of Central Europe during the late stages of the war with a return later to its former level, but the precise reason was not proved. The low protein content is the generally accepted explanation, thus encouraging the adoption of diets of that type, but reliable evidence of their value is lacking. Theobald[4] has taken up the view that the toxaemias of pregnancy are deficiency diseases, and advocates a complete diet, rich in vitamins, calcium, iodine, and iron. The diet he is trying at present includes two pints of milk daily, a tablespoonful of cod-liver oil, with butter, fruit, and green vegetables. If the oil is not readily tolerated, concentrates of vitamins A and D (and sometimes B and C) with iodized salt are substituted, and iron, if the patient is anaemic. The need for calcium[5] during pregnancy is clear in view of the increased call on the maternal supply, especially in the last two months, but the problem is rather that of discovering the form in which it is not only assimilated but also made readily available. The interrelationship between calcium absorption and phosphorus and vitamin D indicates the need for consideration of these factors. Milk, butter, and cheese contain calcium in an absorbable form, but the quantity may be insufficient to maintain an adequate and readily available maternal reserve in late pregnancy. Owing to uncertainty and delay in oral administration, intramuscular injection of calcium gluconate is suggested as the best means to this end. To lessen the risk of acidosis, extra carbohydrate, on the same lines as in preparation for a serious operation, is a reasonable precaution in the last few weeks, particularly in cases in which a prolonged labour is anticipated. Little can be added to the dietary requirements quoted from Marshall, beyond stressing the need for fresh food and for the protein element to be supplied by fish, eggs, milk, and cheese rather than meat. Besides diet full attention must be paid to personal hygiene. The importance of regular evacuation of the bowels is well recognized. The mode of life and precautions advised for those liable to, or who have suffered from, chronic nephritis can scarcely be amiss, such as care during sudden changes of temperature, avoiding chills and crowded assemblies where chance infections are readily picked up, together with the search for septic foci and their treatment, if found.

Prevention of Complications.—The lack of a reliable preventive system as a first line of defence necessitates a retirement to the second line, the recognition of the early signs of disordered metabolism followed by remedial measures directed to the restoration of the normal before more serious trouble arises. It entails, first, the frequent examination of all expectant mothers, next the thorough investigation of all cases exhibiting symptoms or signs that may be regarded as evidence of a toxaemic condition, and, finally, the prompt treatment of those falling within this category by dietetic measures as already indicated, and the administration of magnesium sulphate and alkalis. The woman must be kept in bed to allow of accurate observation and to lower body metabolism, and the duration of observation determined by the history and progress of the case. Distinct improvement under treatment naturally affords sound reason for continuance, while its absence and, still more, increasing gravity indicate termination of the pregnancy before more serious consequences result.

Maternal Prognosis

Up to the last fifteen years or so the risk run by toxaemic pregnant women was reckoned almost wholly in terms of eclampsia, but the supervision of the expectant mother through successive pregnancies brought to notice remoter risks in persistent or recurrent albuminuria, which have attracted increasing attention. Judging from mortality rates it would seem that there is exaggeration in both cases, for no diminution of the death rate from eclampsia is shown from 1921 to 1931, and a scarcely appreciable degree since, in spite of the large number of pre-eclamptics saved from supposititious convulsions by treatment, while the mortality from renal disease of married as compared with single women[6] does not indicate that added risk anticipated from the gloomy prognostications of obstetricians.

Eclampsia.—The statement that eclampsia is a "preventable disease" is no more than an intelligent anticipation regardless of things as they are at present, when there is no generally accepted means of preventing toxaemic states, and cases under treatment may surprise us by falling into convulsions. Further, there is a material proportion of cases, from 5 to 15 per cent., in which the onset is too rapid to offer even a fleeting opportunity for prevention. The warning of impending convulsions is given, roughly in order of importance, by rising blood pressure, lessened secretion of urine, severe headache, visual disturbance, and epigastric pain. But even these signs may escape notice, particularly during intra- and post-partum onset. As one whose hospital service began before the day of systematic ante-natal care, blood-pressure estimations, and biochemical tests, the impression I obtained of eclampsia was of an acute condition coming on suddenly, and, when recovered from, clearing up rapidly. But enough of the severer types of albuminuria came into the wards, and so seldom attained the expected convulsive stage, for me to regard cases of gradual onset as of chronic renal disease, as doubtless some of them were, or as a chronic type of toxaemia in which renal symptoms were predominant and convulsions unusual. These cases were observed for longer than is the practice to-day, and experience of them left me with grave doubts of their pre-eclamptic nature. The prognosis of eclampsia depends largely on the number and frequency of the fits and their sequelae; deep coma, high fever, rapid pulse rate, being associated with successive and severe convulsions, make the outlook grave. Jaundice also is of bad prognosis. Of good omen after cessation of fits are early return to consciousness, fall of pulse rate, and increased excretion of urine. Occasionally a marked polyuria, up to 200 oz. and more in twenty-four hours, occurs, and within a week urine that boiled solid may show no more than traces of protein.

Toxaemic Albuminuria.—Here prognosis is largely determined by the response to treatment. The daily

amount of urine passed affords a better index than the amount of protein in the urine, and diminution of blood pressure and oedema, and improvement generally, makes the issue favourable. A residual albuminuria is not of moment provided the blood urea and urea-concentration tests are satisfactory. So long as improvement is maintained the pregnancy can be allowed to continue, but the objections to its termination are greatly reduced once the last month is reached.

Recurrence in Subsequent Pregnancies and Permanent Renal Damage.—In this regard prognosis is guided chiefly by the duration of the illness and completeness of recovery. The severity of the attack is of little moment compared with its length, for the chronic type is more likely to be followed by recurrence or chronic nephritis than eclampsia or a shorter and sharper non-convulsive toxaemia. Hence the importance of terminating the pregnancy before permanent damage results. For this reason Arwyn Evans[7] makes fourteen days of albuminuria the limit, and in so doing seems to me to err in his standard, for he has taken the least reliable one. His finding that young patients run less risk than the older multiparae should encourage longer trial in the former. The same factors govern advice given regarding risk of recurrence in a subsequent pregnancy. It is usual to recommend an interval of two years before the test of another pregnancy, but the time may be shortened for women of an age at which fertility is lessening fast. Husband and wife must fully appreciate the close supervision required throughout such pregnancies; also that failure on a second trial prohibits further chances being taken. If there is no return, the probability is that future pregnancies will also be unaffected.[8] Persistent high blood pressure is unfavourable. Banister[9] regards a systolic pressure below 150 mm. Hg as an indication that recurrent albuminuria is unlikely. Sometimes ocular symptoms arise that put the eyesight of the mother in jeopardy; rather than risk this disaster the pregnancy should be ended on this account alone.

Foetal Prognosis

Although there is a definite risk of intrauterine death of the foetus in non-convulsive toxaemia, it is much less than in the convulsive, in which the fits themselves add greatly to this risk. Danger to the foetus from toxaemic states is less than in chronic nephritis.

REFERENCES

[1] Browne, F. J.: *Journ. Obstet. and Gynaecol. British Empire*, 1933, xl, 1160.
[2] Marshall, F. H. A.: *The Physiology of Reproduction*, second edition, 1922, p. 555, London, Longmans, Green and Co.
[3] Harding and Van Wyck: *Amer. Journ. Obstet. and Gynecol.*, 1932, xxiv, 826.
[4] Theobald, G. W.: *British Medical Journal*, 1933, ii, 376.
[5] Cowell, S. J.: *Proc. Roy. Soc. Med.* (Sect. Obstet. and Gynaecol.), 1935, xxviii, 1399. (Abstract *British Medical Journal*, 1935, i, 1090.)
[6] Theobald, G. W.: *Lancet*, 1933, i, 626.
[7] Arwyn Evans, M. D.: *Journ. Obstet. and Gynaecol. British Empire*, 1933, xl, 1024.
[8] Gibberd, G. F.: Ibid., 1934, xli, 23.
[9] Banister, J. B.: *British Medical Journal*, 1930, ii, 857.

A. Schwarz (*Zentralbl. f. Gynäk.*, July 13th, 1935, p. 1648) states that of 258 curettings done from 1929 to 1934 at a Vienna clinic for diagnostic purposes in cases of atypical bleeding during the pre-climacteric or post-menopausal years, no fewer than twenty-six (10.1 per cent.) showed the presence of carcinoma. Subsequent investigations done three to six years after the ensuing radical operations failed to show in any instance that the curetting had favoured extension or metastasis.

OVARIAN AND PITUITARY HORMONES*

BY

MARGARET FAIRLIE, M.B., Ch.B., M.C.O.G.

ASSISTANT TO THE PROFESSOR OF OBSTETRICS AND GYNAECOLOGY, UNIVERSITY OF ST. ANDREWS

Irregularities of menstruation are very often met with in the routine of general practice, and until recently it has been customary to diagnose excessive or irregular bleeding, exclusive of new growths, as endometritis in one of its many subdivisions—glandular, interstitial, chronic, and so on. It is now an accepted fact that endometritis, due to previous infection, is a comparatively rare disease, and should only be diagnosed when inflammatory cells are present in considerable numbers; in true chronic endometritis, the detection of plasma cells is specially significant. Although sometimes a searching inquiry is entailed, it is generally possible to place these variations from the regular cycle into one of several well-recognized groups: menorrhagia when the cycle is of normal length but the loss is excessive; epimenorrhoea when the cycle is reduced to twenty-one or even fourteen days but the rhythm remains; metrorrhagia when there is intermenstrual bleeding. On the other hand, there may be amenorrhoea for weeks, followed by continuous bleeding, not infrequently diagnosed as an early miscarriage in a woman of child-bearing age; but it is now recognized that these symptoms are often due, not to pregnancy, but to a disease in which ovulation does not take place—namely, metropathia haemorrhagica.

The discoveries of the hormones of the ovary and the anterior lobe of the pituitary gland have revolutionized many of the accepted theories as to the causes of these irregularities, and the aim of this lecture is to give a short review of the, at present, accepted opinions of the source and functions of these hormones.

Changes in Endometrium during the Menstrual Cycle

The normal menstrual cycle is regarded as being one of twenty-eight days, the first day of the bleeding being taken as the first day of the cycle. The endometrium throughout the cycle is in a constant state of change. Immediately after the period repair sets in when the epithelium grows over and covers the denuded areas, the membrane is thin, and the glands simple straight tubules. This is followed by the proliferative stage, which continues to the mid-interval. The glands become lengthened and tortuous, the membrane swollen and uneven. About the sixteenth day the endometrium begins to assume a peculiar structure, which continues to develop until shortly before the onset of menstruation. The membrane increases in thickness, and closely resembles the decidua of early pregnancy. The glands are dilated with secretion, and have a characteristic corkscrew appearance; this is the premenstrual or pregestational phase, and it is followed by menstruation, during which the superficial hypertrophied layers of endometrium degenerate and are shed into the cavity, and this, together with the blood which is simultaneously effused, constitutes the menstrual discharge. And then again regeneration and so on to another cycle. Thus the constant change accounts for the rather bewildering old-fashioned classification of endometritis, and when endometrium is required for diagnostic purposes it emphasizes the need for giving the pathologist the exact day of the cycle on which it was removed.

* Post-graduate lecture delivered at Dundee Royal Infirmary, May 9th, 1935.

A Double Ovarian Cycle

What is the factor or factors governing the changes in the endometrium? They are not present before puberty or after the menopause, but throughout the period of normal sexual activity they recur with characteristic rhythm. Turning naturally to the ovary a definite cycle is also found here, recurring with characteristic rhythm. At puberty the immature follicle containing the ovum develops and ripens and becomes the Graafian follicle, and the hormone, oestrin, is secreted by the granulosa cells of the follicle. In the few days preceding rupture this follicle rapidly increases in size, and when fully mature—it ruptures between the fourteenth and sixteenth days—the ovum escapes and passes into the Fallopian tube, where, if it has not been fertilized, it rapidly degenerates. If fertilization does occur the ovum, when it reaches the uterine cavity, proceeds to embed itself. After rupture of the Graafian follicle the cells lining its walls assume a new structure, and a convoluted yellow body, the corpus luteum, is produced. The secretion of oestrin still goes on, but another hormone, progestin, now appears. If pregnancy has not supervened, retrogression occurs in the corpus luteum with the beginning of menstruation, and it ultimately becomes converted into a structureless hyaline body called the corpus albicans. A new Graafian follicle again assumes control, and so the cycle continues.

If pregnancy has occurred the corpus luteum goes on growing and persists, as the corpus luteum of pregnancy, and the ripening of the next Graafian follicle is arrested until some time after the termination of pregnancy.

The ovary therefore runs a double cycle: ripening of the Graafian follicle, terminating in rupture and ovulation, followed in turn by the formation of the corpus luteum. There is now no doubt that the proliferative phase of the endometrium is controlled by oestrin from the Graafian follicle, and the premenstrual or pregestational phase by progestin from the corpus luteum. This has been demonstrated experimentally on laboratory animals by various methods, and also in the castrated woman. The uterus of an ovariectomized rabbit in time shows atrophy of the muscle and endometrium. The administration of oestrin either by mouth or subcutaneously produces renewed hypertrophy of the muscle and endometrium. This is known as the uterine growth test.

It has also been shown that progestin from the corpus luteum produces the premenstrual or pregestational phase in the endometrium providing the proliferative stage has already been reached. This pregestational phase is absolutely essential for the embedding of the fertilized ovum, and in animals it appears that the continued influence of progestin is necessary for the further development of the embryo, although in women cases have been recorded where after double ovariotomy, performed during pregnancy, the pregnancy has proceeded to term.

Of more clinical interest is the work of Kaufmann of Berlin. He has recently succeeded in producing menstrual discharge in a woman who five years previously had both ovaries removed, and throughout that period had amenorrhoea, so that there could be no question of ovarian remnants being left behind at the operation. By the administration of oestrin, followed by progestin, he produced not only a period, but definite cyclical changes in the endometrium, proliferative changes during the administration of oestrin, and secretory changes following the administration of progestin. Kaufmann has also succeeded by the use of oestrin in inducing a hypoplastic uterus to grow and develop into a normal-sized organ.

Normally the production of large quantities of oestrin in the ripening Graafian follicles is responsible for the growth of the uterus at puberty. It is also assumed that the growth of the pregnant uterus, from a small organ weighing 1½ to 2 ounces to a powerful muscular organ capable of housing and expelling a full-time child, is partly due to the influence of oestrin. That oestrin is not the only factor in producing the growth of the pregnant uterus is seen in extrauterine gestation, where the foetus may go on to full development, but the size of the uterus never increases beyond a two months' pregnancy, indicating that to ensure progressive growth of the pregnant uterus the mechanical stimulus of the placenta in the uterine cavity is necessary.

From the Graafian follicle where it is secreted oestrin passes to the blood, and the amount present in the blood increases from the time of rupture of the follicle until menstruation, when there is a sudden drop. Oestrin is excreted in the urine, from 1,200 to 2,000 m.u. in a normal menstrual cycle, with an enormous increase in pregnancy of over 50,000 m.u. in twenty-four hours, but it has been suggested that the placenta is responsible for a large part of the production during pregnancy.

The amount of oestrin is generally estimated in mouse units, and therapeutic preparations are standardized in terms of mouse units. In mice certain characteristic features are found in vaginal smears at the height of oestrus, which of course are absent in an ovariectomized animal. If such an animal is treated with injections of oestrin the changes reappear in the vagina, and the least amount of oestrin necessary to produce oestrous symptoms is called a mouse unit.

Source and Functions of Ovarian Hormones

The source and functions of the ovarian hormones would now appear to be in an undisputed position. To recapitulate, the Graafian follicle with oestrin dominates the hypertrophic phase of the endometrium, the corpus luteum with progestin dominates the premenstrual phase; but progestin produces this phase only if the endometrium has been previously sensitized by oestrin. If pregnancy occurs progestin is responsible for the formation of the decidua, and also prevents the ripening of fresh Graafian follicles. Periodicity and rhythm prevails in both uterus and ovaries throughout normal sexual life, and the obvious question arises, Is there a mechanism controlling this rhythm, and, if so, where is it to be found?

Clinical evidence of the relationship between the ovary and pituitary gland has long been recognized in Fröhlich's syndrome as being due to hypopituitarism, but American research workers were the first to approach the question from the opposite angle, and they demonstrated by means of a fresh implant from the anterior pituitary, and repeated injections of the extract, that the animals showed gigantism, and that there was enormous activity in the follicular system of the ovary.

Interaction between Pituitary and Ovaries

A single implant of anterior pituitary lobe into an immature mouse produces five days later full maturity, seen in the oestrous changes in the vaginal smear, and complete development of the uterus, and also abnormal activity in the ovaries. Therefore it would appear that there is a hormone in the anterior pituitary lobe which stimulates the Graafian follicle to the production of oestrin, which, in turn, stimulates the immature uterus to grow, and to produce oestrous changes in the vagina. The characteristic changes in the ovaries are haemorrhage into the unruptured Graafian follicles (blood spots) and the formation of corpora lutea containing imprisoned ova. These changes indicate the presence of a hormone in the anterior lobe of the pituitary gland, which leads to the production of progestin in the corpora lutea. And further, if these experiments are carried out on an ovariectomized animal, no effect whatever is produced

on the uterus or vagina, showing that the pituitary acts only through the agency of the ovary, and it is now regarded as the "starting mechanism or motor of the ovary."

This interaction between the pituitary and ovaries has been demonstrated in ovariectomized animals where what are known as castration cells appear in the anterior pituitary. The appearance of these cells can be prevented by the administration of oestrin, and they reappear with its withdrawal, so that it would seem that, while the anterior pituitary has a profound action on the ovary, the products of the reaction also affect the pituitary. In other words, the anterior pituitary stimulates the production of oestrin, and oestrin in turn affects the anterior lobe.

Prolan A and Prolan B

This hormone of the anterior lobe is called prolan, and because of its dual action it is thought there are two—prolan A responsible for oestrin, prolan B for progestin, the Rho I and Rho II factors of Crew and Wiesner. The Aschheim-Zondek test for pregnancy depends on the presence in the urine of prolan, which is produced in excess due to the hypertrophy which normally occurs in the pituitary gland during pregnancy. The experiments already referred to also show that there is a growth-producing factor in the pituitary which is seen in gigantism.

Prolan A is thus responsible for the development of the Graafian follicle, prolan B for the corpus luteum ; but what is responsible for the rupture of the Graafian follicle and ovulation? It is now accepted that, generally speaking, ovulation occurs between the fourteenth and sixteenth days of the cycle, and a convincing proof is the recovery of ova by reverse irrigation of the Fallopian tubes at operation between these dates. Examination of these recovered ova also showed that they have a very short span of life, signs of degeneration being apparent in twenty-four hours or, according to Knaus, even less, which is contrary to the popular opinion that an ovum may survive for two or three days. Other methods of establishing the date of ovulation are by histological examination of the endometrium, showing early secretory changes, indicating recent ovulation, or of a young corpus luteum removed at operation ; but the results of these examinations give a wider margin. It has also been stated that there is a sudden rise in the excretion of prolan A in the urine about the middle of the menstrual cycle, which may be the stimulus to ovulation, and the recognition of this rise would indicate the time of ovulation.

The Time of Ovulation

In a recent publication Knaus limits the time of ovulation to an exact day—the fifteenth day before the onset of the period in women with a normal reproductive physiology of ovulation—and gives convincing proof. It has been shown experimentally in rabbits that during the corpus luteum phase the uterine muscle becomes flaccid, and gives a negative reaction to the extract of the posterior lobe of the pituitary gland, and that this change begins at exactly the same time as the corpus luteum begins to form. The return of the muscle to normal activity occurs when the activity of the corpus luteum ceases. By means of an apparatus for recording the rhythmical contractions in the human uterus *in situ*, Knaus has shown that during the first fourteen days of the cycle the reaction to pituitrin is positive ; on the sixteenth day there is a striking change with a negative reaction to pituitrin, which continues until at least three days before the onset of the period, but during the twenty-four hours immediately preceding the period it has reverted to the positive reaction which characterizes it during the first fourteen days of the cycle. From these observations Knaus concluded that ovulation in women with a normal twenty-eight-day cycle must take place during the two days which precede the time at which loss of reactivity to pituitrin is detected—that is, between the fourteenth and sixteenth days after the beginning of the last period. As a result of further clinical investigations he limits the time of ovulation to the fifteenth day before the onset of the period. The time of ovulation is therefore now generally regarded as occurring between the fourteenth and sixteenth days ; but the factor causing actual rupture of the follicle is not yet known, and the problem as to why the endometrium should bleed every month is still unsolved.

Clinical Applications of New Knowledge

Of what value are these discoveries to the general practitioner, and how is their importance to be assessed in relation to diagnosis and treatment? The pregnancy diagnosis test of Aschheim-Zondek is regarded as a most brilliant scientific discovery. This test shows an accuracy of about 99 per cent. some few days after a period has been missed. It depends on the presence of an excess of prolan in the urine of a pregnant woman, which when injected into immature mice produces enormous activity in the follicular system of the ovaries. Not only pregnancy, but by a special quantitative analysis hydatidiform mole and chorion epithelioma are successfully diagnosed.

Metropathia Haemorrhagia

It is only by a recognition of the constant rhythmical changes going on in the normal endometrium, secondary to rhythmical changes in the ovary, that the pathology of metropathia haemorrhagica has been clearly understood. There is a period of amenorrhoea of some weeks' duration, followed by almost continuous haemorrhage, persisting for weeks, or it may be months. It is rare to find excessive loss or large clots, which is an important clinical factor in the differential diagnosis from an early miscarriage, and the bleeding resembles an ordinary period which will not stop. Most frequently it occurs from the age of 40 onwards, but it is also seen in the years succeeding puberty, and in fact it may occur at any age between puberty and the menopause. The uterus may be slightly enlarged ; a cystic ovary is often palpable due to a persistent follicular cyst. There is no corpus luteum. The endometrium is much thickened, and is generally removed in ribbon-like fragments with the curette. Microscopically, it always shows the hypertrophic phase, but in excess and of a pathological nature, with cystic dilatation of the glands, and, in addition, areas of necrosis in the superficial layers of the membrane. There are no secretory changes, as there is no corpus luteum. During the period of amenorrhoea the endometrium is under the constant stimulation of oestrin, which persists in the unruptured follicle. What actually precipitates the bleeding is not yet known, because the periods of amenorrhoea vary considerably ; neither is it known why the bleeding should persist so long, even allowing for the much-thickened endometrium. That the hyperplasia of the endometrium is produced by prolonged and excessive stimulation by oestrin from the persistent Graafian follicle has been demonstrated by Kaufmann, who was able to produce the same cystic dilatation in the glands, and hypertrophy of the stroma in a castrated woman, by the administration of large doses of oestrin spread over several weeks.

In the treatment of metropathia haemorrhagica the administration of oestrin in any of its forms is therefore

definitely contraindicated. Curettage is necessary for diagnosis, and removal of thickened endometrium sometimes gives relief. Proluton (corpus luteum hormone) is now giving encouraging results. It is said that resection of the cystic ovary may lead to cystic formation in the other; but, nevertheless, this operation is often followed by definite relief, and should be performed before hysterectomy is resorted to in young subjects. Patients over 40 present no difficulty, as they are most successfully treated by the intrauterine application of radium. It is well to warn the patient of the possibility of irregular haemorrhage up to six or eight weeks after the treatment.

Epimenorrhoea: Sterility

In epimenorrhoea the cycle remains regular, but it is reduced to twenty-one or fourteen days. Ovulation still occurs normally, but there is a speeding up of the cycle. This condition not infrequently follows parturition, and as it is known that the anterior lobe of the pituitary gland hypertrophies during pregnancy, Shaw suggests that the acceleration of the ovarian cycle may be explained by assuming that the activity of the anterior lobe persists, with the result that follicles ripen and ovulate more frequently. The treatment is unsatisfactory. In patients over 40, after a preliminary curettage, radium is again most satisfactory. In younger patients the treatment resolves itself into rest at the periods, curettage, and full doses of iron to combat the anaemia, if present, with hysterectomy as a last resource.

By the discovery that menstruation may occur without ovulation, a new factor has arisen as to the possible cause of sterility. It is now considered that an essential part of the investigation in a sterile woman is examination of the endometrium one or two days before the period is due. Secretory changes denote a recent corpus luteum, and therefore ovulation; absence of such changes denotes a non-ovulating woman.

Other Applications

Interest in the value of hormone therapy was unquestionably stimulated by the publication of Kaufmann's results of the administration of ovarian hormones in a castrated woman. He was able to produce menstruation by the use of progynon (oestrin), in doses far in excess of any that had been previously employed, over a period corresponding to the follicular phase in the cycle, followed by the administration of proluton (progestin) during the period normally governed by the corpus luteum. As previously stated, he was also able to demonstrate the normal cyclical changes in the endometrium. Primary amenorrhoea is frequently accompanied by an infantile uterus, conical cervix, and a narrow short vagina. It is known that at puberty the uterus develops steadily under the prolonged and constant influence of oestrin. By the administration of large doses of oestrin over a period of three to six months Kaufmann has succeeded in stimulating an infantile uterus to grow to an advanced stage of development, although actual menstruation has not yet been produced.

Kaufmann next turned his attention to the treatment of secondary amenorrhoea. In these cases examination will usually reveal a perfectly normal uterus and ovaries, and often there is a history of a normal menstrual cycle for some years succeeding puberty. He again administers large doses of progynon at intervals of three days over a period representing the first half of the cycle, then, after an interval of three days, during which ovulation and the formation of the corpus luteum is taking place in a normally menstruating woman, he administers proluton on five consecutive days. He found that on the second day after the last proluton injection menstruation begins. This treatment is carried out for three consecutive months. Whether or not this apparent return to normal which occurred in his series of cases will be of a permanent nature after withdrawal of the hormones has not been firmly established.

Scanty menstruation with dysmenorrhoea is undoubtedly benefited by the administration of progynon alone given intramuscularly during the first half of the interval, and also by the mouth. There is definite increase in the menstrual flow, and alleviation of the dysmenorrhoea. Menopausal symptoms are successfully dealt with by progynon, given by mouth in mild cases, or by injection once or twice a week if the symptoms are distressing.

Conclusion

As a result of the brilliant investigations carried out in Britain, America, and the Continent, opinion as to the source and functions of the ovarian hormones is firmly established, and attention is now directed towards elucidating the problems of the anterior and posterior lobes of the pituitary gland. Until the results of these researches are forthcoming, clinicians should refrain from the indiscriminate use of hormones. Hormone stimulation may be associated with epithelial activity, but it is comforting to learn that in laboratory experiments malignant formation as a result of such stimulation appears to be confined to immature animals.

THE FALLACY OF THE SUGAR TOLERANCE TEST IN THE DIAGNOSIS OF DIABETES MELLITUS

BY

OTTO LEYTON, M.D., D.Sc., F.R.C.P.

PHYSICIAN TO THE LONDON HOSPITAL

The methods adopted in different countries to diagnose diabetes mellitus are not identical. In England the majority of practitioners ask the consultant to make the diagnosis at a single consultation, whilst in the U.S.A., Germany, and several other countries they expect their patients to be admitted to a clinic for the investigations which will permit a definite diagnosis. This may be the explanation of the popularity of the sugar tolerance test in this country. There is much to be said in its favour, because if it be carried out after a fast of fourteen hours on an individual who has had a generous diet, rich in carbohydrates, for the preceding week, a normal curve excludes diabetes mellitus. Until recently I was of the opinion that the sugar content of the blood rising above 0.25 per cent., and remaining high for two hours, indicated diabetes mellitus. The five cases which I record prove that a so-called positive sugar tolerance test does not necessarily mean that the patient is suffering from diabetes mellitus.

I have reason to believe that hyperglycaemia following the ingestion of 50 grams of glucose in individuals who possess metabolisms which allow them to utilize large quantities of starch has been described previously, but I have not succeeded in finding the paper upon the subject, which most certainly has not received the attention it merits. It might be argued that because it has not received attention it must be rare and only of academic interest, but a condition cannot be recognized by those unacquainted with its existence. It would not be surprising if among the patients of those physicians who treat diabetes by restricted diet a percentage of the most successful cases which have never complained of thirst or polyuria proved to belong to the category of those recorded here.

it is difficult to see how the peculiarity would have been recognized before the period of high carbohydrate diets in diabetes mellitus, because the patients would have been given restricted diets—would have suffered only from the ills arising from too much fat and protein. The first case which came my way astonished me so greatly that I asked one of the most celebrated biochemists to meet me over the case, hoping to learn some physiological explanation of the phenomenon—which, alas, was not vouchsafed.

Case I

A man, aged 56, was sent to me because sugar had been found in his urine. Eleven years previously he had had pancreatitis. More recently he had developed thrombo-angiitis obliterans in his left leg. He had not modified his diet and was submitted to a sugar tolerance test, but, through some misunderstanding, had not fasted for fourteen hours. The sugar content of the blood at the beginning was 0.17 per cent., and at half-hour intervals following 50 grams of dextrose by the mouth was 0.27 per cent., 0.32 per cent., 0.3 per cent., 0.24 per cent., 0.2 per cent., and 0.2 per cent. ; 400 c.cm. of urine were passed during the test, containing 1.5 per cent. of sugar.

The patient was told that in all probability he was suffering from diabetes mellitus, and was advised to come into a nursing home for adjustment of diet and insulin. He was placed upon a diet consisting of carbohydrate 250 grams, protein 90 grams, and fat 100 grams, and the sugar in his blood estimated at various times. The concentration did not rise above 0.18 per cent., and therefore insulin was not required. He was subjected to a test consisting of a gradual increase of carbohydrate in the diet with estimation of sugar excreted in the urine. A somewhat unusual observation was recorded in that the amount of sugar excreted was greater when the diet consisted of only 50 grams "G" than when it was 300 grams "G." The sugar tolerance test was repeated, and proved to be of an identical form, but started 0.04 per cent. lower. This patient during the last three years has continued to eat and drink whatever he likes and has not developed diabetes mellitus.

Case II

The second case recognized by me was a man, aged 41, in whose urine sugar had been found. The patient did not complain of symptoms of diabetes mellitus, but of languor and depression. It is true that he stated that his sight had altered recently, but that may have been due to the hyoscine in the medicine he had been taking. His diet had not been modified, and after fourteen hours' fast he was submitted to a sugar tolerance test, and the concentration in the blood at half-hour intervals was 0.11 per cent., 0.19 per cent., 0.25 per cent., 0.27 per cent., 0.18 per cent., 0.13 per cent., and 0.12 per cent. He was able to eat 300 grams of carbohydrate in the form of starch daily without the sugar content of his blood rising above 0.18 per cent.

Further observations were made on this patient. It is generally recognized that the pancreas of a diabetic acts better after rest than after having been fully exercised, whilst that of a normal healthy person acts better after having been exercised than after rest. Sugar was excluded from his diet whilst he was in hospital. The curve representing the concentration of sugar in the blood following the administration of 50 grams of glucose by the mouth showed that the power of restoring sugar was better when the pancreas had been exercised than when it had been rested. Therefore it was concluded that this patient might eat ordinary food. This he has done, and has not developed any evidence of diabetes mellitus.

Case III

A woman, aged about 50, sought my advice on March 26th, 1934, and gave a history that nine years previously she had had thrombosis in a vein of her leg. Sugar had been found in her urine, and a sugar tolerance test performed, which had led to her being told that she had diabetes mellitus. She objected to having insulin, and was given a restricted diet. During the last two years she had lost weight slowly and became fatigued too easily.

The patient appeared to be enjoying good health, and, since I have doubts whether true diabetes mellitus can be arrested by a restricted diet, I asked her who had diagnosed diabetes mellitus nine years ago. She replied, "You, Sir, at the London Hospital." Upon request she consented to come into hospital again, where it was found that the sugar tolerance test with 50 grams of glucose by the mouth gave the following concentrations of sugar in the blood: fasting, 0.15 per cent., 0.18 per cent., 0.28 per cent., 0.22 per cent., 0.28 per cent., 0.28 per cent., and 0.2 per cent. This test was repeated with practically the same result. The effect of placing the patient on a very restricted diet for several days before carrying out the test was trivial, a very similar curve resulting.

She was placed upon a diet of carbohydrate 50 grams, protein 36 grams, fat 39 grams for seven days, and during that period the sugar content of her blood varied from 0.065 per cent. to 0.22 per cent. The urine contained a trace of sugar, but too little to estimate by the usual methods. A gradual increase in the carbohydrates was made, and when the patient was on carbohydrate 249 grams, protein 81 grams, and fat 62 grams the sugar content of the blood rose as high as 0.22 per cent. and fell as low as 0.07 per cent. The sugar content of the urine, which was of normal volume, did not rise above 0.3 per cent.

The patient was advised to eat and drink whatever she liked and to report at intervals of six months. On the three occasions upon which she has been re-examined the tests have shown that there has been no deterioration in her metabolism.

Case IV

The fourth case was a man, aged 36, who complained of a dry mouth, but not of thirst. Sugar was found in the urine. A sugar tolerance test was performed at the London Hospital. The sugar content of the blood after a fast was 0.128 per cent., rising to 0.236 per cent. half an hour after the ingestion of 50 grams of dextrose, and to 0.27 per cent. after an interval of two hours. The patient was admitted to hospital and given a diet of carbohydrate 253 grams, protein 92 grams, and fat 94 grams. The sugar content of the blood at 6 a.m. was 0.12 per cent., at 9 a.m. 0.18 per cent., at midday 0.09 per cent., at 3 p.m. 0.095 per cent., at 6 p.m. 0.08 per cent., and at 8 p.m. 0.166 per cent.

The patient was advised to eat and drink whatever he liked, and to present himself for re-examination in a year's time. He was then submitted to two sugar tolerance tests, one whilst on a diet of carbohydrate 302 grams, protein 101 grams, and fat 101 grams, resulting in the following concentrations of sugar in the blood at half-hour intervals: 0.11 per cent., 0.153 per cent., 0.18 per cent., 0.15 per cent., 0.15 per cent., 0.15 per cent., and 0.14 per cent., and again after five days' diet consisting of carbohydrate 40 grams, protein 49 grams, and fat 50 grams ; this gave 0.18 per cent. fasting, then 0.2 per cent., 0.28 per cent., 0.23 per cent., 0.21 per cent., 0.2 per cent., and 0.15 per cent. Reducing this to the same starting level it would read 0.11 per cent., 0.13 per cent., 0.21 per cent., 0.16 per cent., 0.14 per cent., 0.13 per cent., and 0.075 per cent. No conclusion can be based upon two curves so closely similar.

The fifth case was not recognized by me until ten years after the first consultation, but the patient lived in South Africa and came to England every five years.

Case V

On June 5th, 1925, a man, aged 62, gave me the following history. Sugar had been found in his urine in 1910, and he had been placed upon a strict diet. The local doctor in South Africa did not think that he was a case of orthoglycaemic glycosuria because years previously he had insured his life and then sugar had not been found in the urine.

In 1914 the diet was modified according to the teaching of F. M. Allen. In 1923 the son-in-law of the patient, who is a doctor of medicine, took the patient to a clinical laboratory, where a sugar tolerance test was carried out, which confirmed the diagnosis of diabetes mellitus. A restricted diet led to the patient losing weight, and therefore insulin was prescribed. In June, 1925, he was taking ten units of insulin twice daily and a diet of carbohydrate 81 grams,

protein 101 grams, and fat 158 grams. I increased the carbohydrate by ten grams. The next consultation was May, 1930, when a further increase in diet was prescribed.

At the next consultation, on June 24th, 1935, I realized that this patient had at no time had symptoms of diabetes mellitus, and my notes told me that the diagnosis rested upon a sugar tolerance test alone. I advised him to cease taking insulin and to eat and drink whatever he liked. The sugar content of his blood an hour after a breakfast consisting of eggs, bacon, tea, a roll, toast, butter, and marmalade was 0.14 per cent. A single observation the day after the cessation of insulin could prove nothing, because a rested pancreas will function well for a short time after it has been made to carry a full load, even if its capacity is only a fraction of the normal. Repetition of the observation, under identical conditions, after a month's cessation of insulin, and on ordinary food, showed that the sugar content of the blood was 0.14 per cent. In order to find out whether this patient really belonged to the same category as the others mentioned above, he was submitted to a sugar tolerance test. The concentrations of sugar in the blood at half-hour intervals following the ingestion of 50 grams of glucose were, fasting, 0.14 per cent., 0.15 per cent., 0.27 per cent., 0.33 per cent., 0.21 per cent., 0.16 per cent., and 0.11 per cent. The patient was advised to eat and drink whatever he liked, but to avoid grapes and unfermented grape juice, and to report every six weeks until he returned to South Africa in October.

Commentary

These five cases are of interest in so far that they prove that there is a condition which may easily be mistaken for diabetes mellitus, a condition which may have a material effect upon the correct treatment of diabetes mellitus.

In England the majority of physicians still advise restricted diet upon the diagnosis of diabetes mellitus, although perhaps there is a gradual veering round to the view expressed in a few books that insulin should be ordered immediately upon the definite diagnosis of diabetes mellitus, provided the sugar concentration of the blood rises above 0.15 per cent. at any time when the patient is on a diet rich in carbohydrate and supplying about 30 calories per kilogram body weight per diem. The majority advise a restricted diet because a number of patients flourish upon that treatment, but what percentage of those cases will prove to be of the type mentioned above still remains to be discovered. Should a large percentage prove to be cases of this type then probably the fashion will change and all cases of true diabetes mellitus will straightway receive a liberal diet and adequate doses of insulin, and then remissions will no longer be considered events of great rarity.

The 1935 edition of the *Register of Members of the Chartered Society of Massage and Medical Gymnastics* reveals a steady growth in numbers, there being included the names and addresses of over 9,500 masseuses and masseurs throughout the world. By means of the place index it is easy to find out who are practising in any neighbourhood, and additional qualifications, such as for medical electricity, light and electrotherapy, and medical hydrology, are recorded. Members of the Chartered Society undertake no cases except under the direction of a medical practitioner; they do not advertise except in recognized medical and nursing papers; and they do not sell goods to patients in a professional capacity nor accept secret commissions on the sale of goods. By such restrictions the Chartered Society has built up a high standard of professional honour, and by its training and careful examinations has ensured that its members shall be fully qualified to carry on any treatment which may be ordered. The *Register* is supplied free on application to any medical practitioner. The address of the Chartered Society's offices is Tavistock House (North), Tavistock Square, W.C.1.

STENOSING TENDOVAGINITIS AT THE RADIAL STYLOID

A BRIEF REVIEW OF SOME OF THE LITERATURE WITH REPORT OF A CASE

BY

W. MOIR BROWN, M.B., CH.B., F.R.C.S.ED.

ASSISTANT SURGEON, HEREFORDSHIRE GENERAL HOSPITAL

In 1895 de Quervain, working under Kocher, described a condition affecting the tendon sheath of the abductor pollicis longus and extensor pollicis brevis, with very definite symptoms and signs, and responding readily to appropriate treatment. Kocher named it "stenosing fibrous tendovaginitis" at the radial styloid, although Finkelstein has since found the condition in other of the extensor tendons at the wrist. The lesion consists in a fibrosis of the common sheath as it lies in the groove at the lower end of the lateral surface of the radius, covered over by the most lateral portion of the dorsal carpal ligament. In this superficial situation the tendons are presumably exposed to trauma and increased friction.

Since de Quervain's recognition numerous articles have appeared from time to time in foreign journals describing cases, but the only references in British literature to be found through the ordinary sources of research are Mercer[1] and a mention of it in Jones and Lovett's *Orthopaedic Surgery*.

I have recently had a case under treatment, which prompted me to study this interesting condition. Because it appears to have been strangely neglected by British writers; because I can find no mention of it in the surgical textbooks which I have consulted (apart from Mercer[1] and Jones and Lovett); and because it appears to be such a painful and disabling condition, but one that gives apparently absolute (and, in some cases, dramatic) cures with appropriate treatment—for these reasons I venture to publish this short summary.

Eschle[2] gave a résumé to 1924, reporting on 110 cases, and adding nineteen of his own which were cured by operation.

Wisterstein[3] in 1927 reviewed all accessible cases previously reported, adding fourteen of his own, making a grand total of 154. From his review of the literature he found that the condition occurred most frequently in women past middle age, the ratio of women to men being 10 to 1; average age 55, youngest 15; duration of disease two weeks to one year.

Schneider[4] states that although he has treated between twenty-five and thirty cases, he has been able to collect the records of only fifteen of these, all of which were treated conservatively, giving complete cures in 70 per cent. This surpasses the results of conservative treatment in the hands of any previous observers. Most of his cases were, however, in the comparatively early acute stage. He applied plaster casts to the wrist and thumb, the latter being in the fully abducted and extended position. Treatment lasted for an average of four to six weeks.

More recently Finkelstein[5] reports twenty-four cases, all of which were operated upon, conservative treatment having failed. He asserts that conservative treatment is indicated in the acute stages if seen early, but that if relief is not obtained in four weeks operation is required.

Aetiology

Occurring most frequently in the working classes, stenosing tendovaginitis is to be regarded as being traumatic in origin: there was an acute traumatic onset in six of Finkelstein's cases. Prolonged and excessive use of the thumb seems to be the main factor, as the cases have all occurred in people who habitually use

their thumbs excessively, as in writing, washing and wringing clothes, chopping wood, etc. All observers agree that syphilis and tuberculosis can be definitely ruled out. A few cases have given a rheumatic history.

The lesion appears to be produced by increased friction of the tendons of the two muscles in the groove at the lower end of the radius. Eschle suggests that in consequence of this continued and excessive friction the tendon sheath becomes oedematous, further increasing the friction, a vicious circle being thereby formed, ultimately leading to thickening and later actual fibrosis of the sheath. In this respect Kocher compared it to "trigger finger." It is interesting to note that one case was associated with trigger finger.

Pathology

All observers on operated cases agree that the tendon sheath is much thickened, constricting the underlying tendons, thus interfering with their normal gliding movements. The degree of thickening varies, in some cases being fully six times the normal thickness, and in some it has cut like cartilage. Finkelstein found, in addition to this thickening, such lesions as the tendons themselves covered with granulation tissue, the tendons beyond the constriction bulbous, the groove in the bone covered with granulation tissue, adhesions between sheath and tendons, the tendons under the constriction flattened and dull, and, in some cases, even adhesions between the two tendons.

X-Ray Findings.—All observers except Schneider agree that *x*-ray examinations are uniformly negative. But Schneider found deposition of lime salts in the region of the styloid process in some of his cases. A skiagram of the wrist in my case revealed definite evidence of periosteal irritation in the form of some new-formed bone just above the styloid. In view of Finkelstein's observations in finding granulation tissue in the groove of the bone this is not surprising.

Clinical Features: Case Report

The symptoms and signs in the following case are identical in every respect with those in the vast majority of all published cases. Moreover, whereas some cases have shown one or two of the symptoms and signs, this case presented in some degree every clinical feature which has at some time or other been noted, and may therefore be taken as typical of the condition.

The patient is a widow, aged 62, with a grown-up family living with her, for whom she does most of the work, including all the scrubbing, polishing, washing, and wringing. She had been a housemaid before her marriage.

Previous History and Present Complaint.—"Acute rheumatism" at 37 years of age, when she was confined to bed for three weeks. Has since suffered off and on from "rheumatism"—aching joints and "stiffness in thighs and legs." Has "never needed a doctor" since her illness twenty-five years ago until I saw her in June, 1933, when she came to me complaining of severe pain in the left wrist of about three weeks' duration, of gradual onset after a week's extra hard work of spring cleaning. The pain was situated over and immediately above the styloid process, was described as continuous and boring in character, radiating up the whole arm, and invariably worse at nights, sometimes waking her up and at other times quite preventing sleep. It was aggravated by any movement at the wrist, particularly twisting movements, and even more particularly on attempting to "straighten the thumb." Eventually, when I saw her, the arm was quite disabled.

Examination.—There was slight broadening of the whole wrist as compared with the normal one: this, on closer examination, proved to be due to local swelling in the region of the styloid process, so that the "anatomical snuff-box" was almost obliterated. All active movements at the wrist and thumb were painful, so much so that the whole hand was kept almost rigidly at rest. Gentle attempts at passive flexion and extension were slightly painful; radial flexion was slightly painful, but ulnar flexion of the wrist, produced by grasping the fingers of the patient with one hand and the outstretched thumb with the other (the natural easy grasp for doing so), caused excruciating pain in the region of the radial styloid. Pressure just above the styloid was very painful; this was the only point at all sensitive to touch. Crepitation was absent, and nowhere was there any redness or rise in local temperature. Wassermann reaction negative; radiograph showed some periosteal reaction as above detailed.

Treatment and Prognosis

The consensus of opinion favours operation unless the case is seen early, but most cases have already been treated for a considerable length of time as rheumatism, neuritis, neuralgia, and so forth, and show marked fibrous thickening of the sheath. Schneider, however, obtained cures by plaster casts in cases which had shown symptoms for six months. The operation advocated by de Quervain, and practised generally, consists in incising the tendon sheath under local anaesthesia, with or without, according to the severity of the findings, excising a greater or lesser portion of the sheath. No failures have ever been recorded nor any recurrences.

Operation in my case was refused pending a trial of conservative treatment. I was doubtful of the outcome in view of the results of most observers, and was disappointed at not having the opportunity of demonstrating the fibrosis for myself. A plaster cast was applied to the wrist and fully abducted and extended thumb, and was removed after six weeks. This had relieved the pain to a marked degree, but had by no means cured the condition. Another similar cast was applied for a further six weeks, after which great improvement was manifest, the only feature remaining being pain on ulnar flexion of the wrist. A plaster cast was reapplied for another similar period, after which there was complete remission of all symptoms and signs. An elastoplast bandage took the place of a plaster cast for a further three weeks, and the patient was instructed to use her hand and wrist. After this time, as the wrist seemed now to be normal, the patient was told she could consider herself cured.

I had the opportunity of re-examining her in June, 1935, exactly two years after she began to complain, and she told me she had "forgotten all about the wrist," could do anything with it, and had had no return of any pain or discomfort.

Summary

One case is described, which, although not confirmed by operation, agrees so very definitely in its history, clinical features, and subsequent course with confirmed cases of competent observers that there is no room for doubt as to its being a case of stenosing tendovaginitis at the radial styloid.

I make no apology for publishing one isolated case, for I have merely made this case the motive for a short study into the literature of this interesting, but apparently little known or neglected, or perhaps often undiagnosed, condition.

REFERENCES

[1] Mercer: *Orthopaedic Surgery*, 1932.
[2] Eschle: *Schweiz. med. Woch.*, 1924, v.
[3] Wisterstein: *Münch. med. Woch.*, 1927, lxxiv.
[4] Schneider: *Surg., Gynecol. and Obstet.*, 1928, 46.
[5] Finkelstein: *Journ. Bone and Joint Surg.*, 1930, **xii.**

CARDIAC RESUSCITATION

BY

W. B. PRIMROSE, M.B., CH.B.

SENIOR ANAESTHETIST, GLASGOW ROYAL INFIRMARY

The risk of cardiac failure occurring under anaesthesia, although very small, is one that has to be accepted by patient, surgeon, and anaesthetist. Some hundreds of patients die upon the operating table, or rather under anaesthesia, in this country every year. That this should be so is not remarkable from the very nature of surgery and the ailments it seeks to alleviate and cure, but when sound and healthy lives are lost—often during the performance of trifling operations—means to prevent such accidents become of prime importance.

Prevailing knowledge of cardiac failure and its treatment may be gathered from a perusal of any of the numerous works upon anaesthetics. Many reasonable recommendations are given, the last usually being that if the other methods have failed to bring about recovery direct cardiac massage may be tried. Experience is gradually accumulating to show that in cases of complete cardiac failure nothing is of any use but direct cardiac massage, and that there is a definite time within which it must be carried out. If this is observed success may be expected in healthy cases, but if the time limit is allowed to expire, while successful restarting may be accomplished, the patient will not live for more than a few hours.

Meeting with an occasional case of cardiac collapse when working with Mr. G. C. Swanson on "receiving nights" in the Glasgow Royal Infirmary during the past few years, it was the practice to do everything recommended, finally opening the abdomen and carrying out cardiac massage. In one case the heart resumed action after about a quarter of an hour's active massage, even although it had been stopped for about the same length of time. It stopped twice before finally continuing, but the patient died about eight hours later without recovering consciousness. In one or two subsequent cases less time was spent upon artificial respiration, etc., and cardiac massage was commenced earlier with better results. The heart started much more easily and remained in action longer, one case living for about twenty hours. From the behaviour of another case it was ascertained that the brain could not stand arrested circulation even for six minutes, for again death took place many hours later, showing that the cerebral circulation had never resumed completely and that stagnation had slowly spread until the medullary centres succumbed.

From these unfortunate instances we judged that for complete success cardiac massage must be carried out within three minutes of the visible onset of the failure, and that from the moment of failure *artificial circulation* was the urgent requirement of the dying patient, artificial respiration being of secondary importance. It was also evident, from the ease with which the healthy heart could be started, that the organ was not poisoned in these cases, but had merely "stalled," its nervous control having relaxed to too great an extent. This is an important point, because a heart poisoned by any kind of toxaemia will either not respond at all or will do so only feebly and intermittently for a little while.

This information, while of the utmost value, cannot be applied to every case of collapse that occurs during anaesthesia. One requires to know definitely that the failure is complete before embarking upon an abdominal incision. For this purpose we use amyl nitrite, which, when inhaled, has such a stimulating effect upon the depressed heart. The ordinary "faint" recovers immediately with an artificial inhalation of a capsule of this drug, whereas the arrested heart cannot respond at all. We thus get an immediate diagnosis of the condition within one minute. A second capsule may be tried to make sure, but we have not found failure with the first capsule to lead us astray in diagnosing a complete failure.

Failure to produce recovery with amyl nitrite will be found to coincide with the visible, palpable, and audible evidence of cardiac arrest, and is the sign for immediate opening of the upper abdomen. In many cases it is likely that both the surgeon and the abdomen are ready for operation, in which case the matter is very simple; but conditions may be quite otherwise. The anaesthetist may find that he alone possesses the knowledge that is required to save the life of the patient. He must make the best effort he can at preparation of his hands and the abdominal skin, but *whatever happens* the heart must be started by direct manipulation within the aforesaid three minutes.

Technique of Applying Cardiac Massage

The opening of the abdomen for cardiac massage is a very simple matter. An incision sufficiently long to admit the hand is made in the middle line a little below the xiphisternum. Confirmation of the diagnosis will be given by the lack of bleeding and the post-mortem colour of the muscles, which are extremely relaxed. The peritoneum is opened with a little care for the liver—the other viscera have usually fallen back in the general relaxation.

The right hand, inserted through the wound, passes above the liver to the left subphrenic region, where the heart may be felt at rest through the diaphragm. The left hand is placed over the praecordium, the heart thus lying between the two hands. The operator then has to imitate the cardiac beat to the extent of making the ventricular part expel blood, and, to begin with, a rapid rate of compression is adopted for about ten to fifteen seconds, to irritate the organ a little, followed by the pressure at the normal rate of beating. When the heart reacts the peculiar sensation of a living thing slipping under the hand announces successful restarting, and once started it only suffices to wait for a few minutes to be sure that the beat is maintained.

The term "massage" does not convey the correct idea of what is required to restart a heart: it suggests placid stroking of the organ. One of the failures in my own experience was due to a surgeon undertaking the resuscitation himself on these lines. When he handed over to me, after trying for a few minutes, more energetic treatment restarted the heart promptly; but the time was past, and the patient died about twelve hours later. The surgeon said he had no idea that the heart could be so vigorously compressed, nor that such vigorous treatment was necessary for effective recovery. The fear is not of damaging the heart (which is a very tough viscus) by this treatment, but of damaging the diaphragm, which is much more delicate. I am not aware of the latter having occurred in any case.

The position adopted by the hands is a very awkward one, as only the fingers of the right hand are available for compressing the heart. The operator, working at such muscular disadvantage, should not be surprised at a feeling of fatigue in his arms in a very short time, and perspiration is usual if the effort is at all prolonged. These incidentals are mentioned merely to complete the idea of the energy that may be required to restart a heart, particularly in a case in which recovery may be doubtful—for example, in a toxic subject. In these cases massage may be prolonged for some time before being finally successful or otherwise. If possible, oxygen should be given, since the vigorous manipulations effect a certain amount of artificial respiration during the massage. It is definitely beneficial, as may be seen by the colour of the face; and this, along with the artificial pulse that is

usually palpable at the wrist, and the diminishing pupils, gives a remarkable imitation of vitality.

Results in Four Cases

From this point onwards we seemed to be in a better position for dealing with the emergency of cardiac failure, for, although we had been denied complete success, much had been learned for future application should occasion arise. Occasions have arisen during the last three years, and we are able to record four successful cases.

Case 1.—This occurred with a senior surgical colleague, Mr. Milne McIntyre of the Royal Infirmary, to whom I had imparted my views. The case was one of removal of an interval appendix, a resident giving the anaesthetic, mostly chloroform. Collapse set in shortly after the commencement of the operation. As there was no sign of recovery with artificial respiration and adrenaline injected into the heart muscle, Mr. McIntyre opened the abdomen higher up and felt for the heart, which was completely at rest. With very little effort at restarting it took up its beat vigorously and permanently, the patient making a complete recovery.

Case 2.—This was with Mr. J. Mill Renton of the Western Infirmary, whose own experience of cardiac resuscitation was leading him to early intervention. The operation was for removal of a small growth from the abdominal wall of a young woman. I was giving the anaesthetic, in which chloroform figured in the ethyl chloride–ether–chloroform sequence along with oxygen. The collapse was of the usual dramatic kind. Artificial respiration with amyl nitrite was tried without success; adrenaline was also used without effect. Mr. Renton then opened the abdomen and found the heart quite still. After a little manipulation it set off vigorously and permanently, the patient recovering completely. This case was of interest, for the immediate recovery from the ordeal was slow, and the patient, after being in bed for about half an hour, showed marked cerebral irritation, two nurses being required to keep her in bed. This, however, yielded to morphine (1/4 grain), and when she awakened from the sleep so produced her behaviour was quite normal, though there was a gap in her memory for recent events, which disappeared during the next thirty-six hours. The nature of the recovery here suggested a borderline case, caught just within the time limit—say, four minutes from the onset.

Case 3.—This was more of an incident to the operation, which was gastro-enterostomy in a male subject. The surgeon was Mr. G. C. Swanson; a resident gave the anaesthetic. The collapse occurred after the abdomen had been opened, and Mr. Swanson noticed it almost from its commencement. Without preliminaries as to diagnosis, he inserted his hand through the existing incision and found the heart quite stopped. A little manipulation set it going, and the operation was continued to its conclusion, recovery being complete.

Case 4.—This occurred in my hands while I was anaesthetizing a mastoid case in a young man for Mr. James Harper of the Royal Infirmary. A.C.E. mixture with oxygen was being used. Collapse occurred suddenly, about ten minutes from end of operation. Mr. Harper resolutely applied artificial respiration, of which I made use in getting a capsule of amyl nitrite inhaled and absorbed. Meanwhile, after a rapid "scrub-up" and the donning of overalls and gloves, I was ready for the now more than likely abdominal incision, for the other measures had produced nothing in the way of recovery. With hasty preparation of the skin, the abdominal wall was incised and the peritoneum opened. The heart was easily felt, soft and at rest. About half a minute's manipulation sufficed to start it, and the beat was maintained steadily and permanently. Recovery was complete in all respects, although the incision incited some wonder on the part of the patient. In this case closing the abdomen presented a little difficulty to me, unskilled in the art. This was due to the rather rapid recovery of the patient from the anaesthetic now that his circulation was going. A nurse had to administer a little chloroform while I closed the wound, and Mr. Harper finished his operation. I was told afterwards by a surgeon that, under the circumstances, closure by means of "through and through" silkworm would have sufficed and been simpler than closing by layers.

Discussion and Conclusions

Commenting upon these cases it is evident that we are dealing with a purely mechanical breakdown, however it has been produced. The correction of the fault is also purely mechanical. That is why success is so often possible. Compare such a breakdown with, say, suppression of urine or massive collapse of a lung, conditions also occasionally associated with the giving of anaesthetics. We are quite unable to intervene with curative effect in such cases.

A word or two may be said regarding the use of adrenaline, which is at present much favoured in connexion with the treatment of cardiac failure. In these four successful cases no effect of any value was produced by the drug in the first and second cases, which received it, and it was obviously not required in the third and fourth cases, which did not get it. In another recent case of cardiac failure on the table in a young girl massage was unavailing owing to septic toxaemia. Adrenaline was then injected into the heart, after which cardiac massage was again tried, and was most effective. The heart's action, however, only lasted some five minutes, after which neither adrenaline nor massage was of any use. In another two failures belonging to this period—one an obese subject with intestinal obstruction, and the other a case of toxic exophthalmic goitre—adrenaline failed to produce any effect that could be noticed. Briefly, we would state that from our experience adrenaline is of little use in restarting a heart. It cannot reliably initiate pulsation, although it may produce ventricular spasm. Its action is also of very short duration, probably owing to the fact that adrenaline is quickly destroyed in the blood. In spite of occasional cases where this drug seems to play a part, reliance cannot be placed upon it at the expense of valuable time in cases of complete cardiac failure.

As already mentioned, a condition necessary for success is that the patient shall be in fair bodily health. We have had experience of failure in several cases, apart from those mentioned in connexion with the time limit, and we might sum it up by saying that if life is being threatened by any toxic condition such as acute sepsis, advanced diabetes, uraemia, thyrotoxaemia, cachexia, or old age a failure is most likely to resist all efforts at resuscitation and to remain permanent.

In view of what has been said about cardiac failure and its management, we believe that our position in regard to this special risk has considerably improved, for we feel that we should be able to save all the healthy victims and to give the others the best chance in a somewhat embarrassed fight for life.

A joint conference of the Invalid Children's Aid Association and the Central Council for the Care of Cripples will be held on November 7th and 8th at the Drapers' Hall, Throgmorton Street, London, to consider the welfare of cripples and invalid children. It will be opened by the Minister of Health, Sir Kingsley Wood. The subjects for discussion are: infectious diseases and their after-effects, with reference to immunization and other preventive measures; the problem of physical handicap in modern life, with a review of the parts played by local authorities and voluntary associations in fitting the physically handicapped person for modern life; and the after-effects of accidents, including a study of rehabilitation methods, co-operation between cottage, general, and orthopaedic hospitals in the treatment and after-care of accident cases, the problems of industrial accidents, and workmen's compensation legislation. Visits to various institutions will be arranged. The payment of delegates' expenses has been officially sanctioned. The conference fee is 7s. 6d., and further information may be obtained from the honorary secretary of either organization, Carnegie House, 117, Piccadilly, W.1.

Clinical Memoranda

Pulmonary Embolism following Injury to an Old-standing Arterio-venous Aneurysm

In the *British Medical Journal* for April 13th, 1935 (p. 760), there is an account by Mr. J. C. Gillies of an injury to the femoral artery, which led to the formation of a haematoma in Scarpa's triangle, and upon which he successfully operated. Below is an account of a rather similar injury, which did not end so successfully.

On May 5th, 1935, I was called upon to perform a post-mortem examination at the Kowloon mortuary on a Chinese male, aged 30 years. The history was that on the previous evening the man, who was a hawker by trade, was travelling with some friends by river boat from Canton to Hong-Kong to participate in the King's Jubilee celebrations. The boat was crowded, and someone trod on his foot. The resulting annoyance led to a small scuffle, in which he received a knock on the left thigh. He collapsed and died almost immediately.

On examining the body it was seen to be that of a fairly well built man. In the mid third of the left thigh there were the scars of two wounds, such as might have been produced by a bullet on passing through the limb. The larger one, 1 inch by 1 inch in size, was internal to the course of the femoral artery, and the outer one, about half the size of the other, was 4 inches away from it on the lateral aspect of the thigh. A line joining the two wounds would pass through or very close to the course of both the femoral artery and vein. Deep to these scars, which had long since healed over, there was a fluctuating tumour, 5 inches by 4 inches, slightly movable, and appearing to have thick, firm walls. The girth of the left leg six inches below the knee was 2½ inches more than its fellow. On the left shin there was a varicose ulcer 1 inch by 1½ inches in size. Apart from a very small graze on one eyelid there was no evidence of recent injury.

Internal examination showed the tumour to be an arterio-venous aneurysm of the femoral artery and vein. The sac, which was lying deep to the muscles, was divided into two unequal parts. The smaller and more superficial one was the more proximal; its size was 2 by 2 by 1½ inches, and it had a wall nearly 1/4 inch thick, lined with white laminated clot. It communicated on its postero-inferior aspect by means of a wide opening with the larger cavity, 3 by 2 by 4 inches, the walls of which were much thinner. This sac contained a mass of friable brown non-laminated clot, and was more firmly attached to the surrounding muscles than was the more proximal one.

The left lung was dark, somewhat frothy on section, and in the left pulmonary artery there was a piece of brown non-laminated clot obstructing the lumen. All other organs were normal, except the spleen, which was enlarged, dark, and firm, probably the remains of an old chronic malarial infection.

At the inquest it became known that seven years previously, when a soldier, the man had had a gunshot wound of the thigh, and that there had been a swelling at the site of the wound ever since.

The interest of this case is that he should have had such a serious condition present for so long. When I discussed the matter with his friends they said that neither he nor they had paid much attention to it, and that it had not prevented him from carrying on his trade.

Summary.—A case is described in which a bullet wound of the thigh had caused a large arterio-venous aneurysm seven years prior to death. The affected leg was rather larger in girth than its fellow, and the blood supply was sufficiently impaired to allow a varicose ulcer to develop on the leg. Except for this the man had not been greatly inconvenienced by the condition, and was able to carry on with his everyday activities. Death eventually came when a blow on the aneurysm detached a portion of the clot and led to a pulmonary embolism.

K. H. UTTLEY, M.A., M.D., D.T.M. and H.,
Medical Officer, Hong-Kong.

Tetany with Peculiar Blood Changes

Whatever the cause of tetany may be the changes in the chemistry of the blood are characteristic. The proportion of phosphorus to calcium in the blood is disturbed: phosphorus values are higher and calcium contents lower than normal. The quantity of chlorine ions may be unchanged or diminished. There is usually alkalosis of the blood. An apparently typical case of tetany was observed by the writer in which almost all these changes in the blood were reversed.

The patient was a married woman who came of a healthy family. As a child she had had diphtheria and scarlet fever. At the age of 17 she had had gastric ulcer, and at 23 a pregnancy during which there was considerable hyperemesis and loss of weight. When she was 25 she had pneumonia and tonsillitis, and on the fifth day of pneumonia there were tetanic symptoms, which disappeared some weeks later. The patient had been constipated since childhood.

The day before admission (March 22nd, 1933) the patient felt sick, and vomited. Her temperature was 100° F., and she had pain in the right side of the abdomen. On admission nothing pathological was revealed in the region of the thyroid. Her tonsils, chest, abdomen, pulse rate, and blood pressure were normal, and nothing abnormal was found in the central nervous system. Her urine did not contain albumin or sugar.

During the first and second days after admission the patient twice had tetanic attacks. On examination there was pen-holding position of the hands, also muscular cramps in the left leg. Trousseau's phenomenon and Chvostek's sign were strongly positive, also ulnar and peroneal reflexes. Her breath smelt strongly of acetone. Urine: albumin and sugar, negative; acetone and aceto-acetic acid, very strongly positive; specific gravity, 1026; $pH = 5.3$. Eyes: bilateral spasm of rectus internus.

CHEMICAL EXAMINATION OF THE BLOOD

Date	Phosphorus	Calcium	Cl	Alkali Reserve
	Per cent.	Per cent.	Per cent.	Per cent.
March 24th	1.4 mg.	11.3 mg.	0.31	2. vol.
,, 25th	1.7 mg.	12.8 mg.	0 29	16 vol.
,, 29th	—	—	—	29 vol.
April 1st ...	3.2 mg.	12.4 mg.	—	33 vol.
,, 8th ...	—	—	0.30	—

The proportions in normal blood are: phosphorus, 3 to 4 mg. per cent.; calcium, 9 to 11 mg. per cent.; chlorine, 0.36 per cent.; and alkali reserve, 50 volumes per cent. Further tests were done on March 25th with the following results: xanthoprotein, 28; uric acid, 5.6 mg. per cent. (the normal is 3 mg. per cent.); non-protein nitrogen, 20 mg. per cent.; blood sugar, 80 mg. per cent. A test meal showed normal acidity.

After 30 grams of dextrose had been administered by the mouth (fasting) the blood sugar curve was:

Fasting				90	mg. per cent.
30 minutes after administration of dextrose it was				153	,, ,,
60	,,	,,	,,	199	,, ,,
90	,,	,,	,,	176	,, ,,
120	,,	,,	,,	140	,, ,,
180	,,	,,	,,	101	,, ,,
240	,,	,,	,,	73	,, ,,
300	,,	,,	,,	80	,, ,,

The treatment consisted of calcium gluconate intravenously and orally. The attacks became very slight after the third day and disappeared totally at the end of the second week after admission.

As shown above, there was a typical case of tetany treated in an orthodox manner, although the changes in the calcium, phosphorus, and alkali reserve were reversed. The cause of tetany in this case was not explained. It was suggested that it might be over-ventilation of the lungs after an acute attack of influenza with bronchopneumonia.

LEO RAU, M.D.Berlin.

Reviews

MEDICINE IN AMERICA

American Medicine[1] is the first-fruits of the appointment of Dr. HENRY SIGERIST to the William H. Welch professorship of the history of medicine in the Johns Hopkins University at Baltimore, U.S.A. The book is very welcome, and is worthy of careful study by everyone who is interested in the future of the profession, of the voluntary hospitals, and of the medical curriculum. Dr. Sigerist is a Swiss by birth, has held teaching appointments in France, and was in charge of the Institute of the History of Medicine at Leipzig. He is able, therefore, to speak with authority on the conditions prevailing in Europe and to contrast them with those in the New World, which has so recently adopted him. During the short time he has spent in Baltimore he has collected a remarkable amount of information about every branch of the medical profession in America. The book bristles with figures and statistics; but for all that it is most readable, and the conclusions reached are well worthy of the most serious thought.

Dr. Sigerist shows that the condition of the medical profession and that of medical education were chaotic at the beginning of the present century. Each State licensed its own doctors and there was no reciprocity. The schools and the teaching varied enormously. Some were of the highest quality, others were worse than bad. "Fifty years ago," he says, "American schools counted for nothing in world medicine. Twenty-five years ago there were only a few schools which could measure themselves against European institutions. To-day the standard of instruction equals that of most European countries, and in many places and on some points is definitely superior." The revolution began in 1908 when the Carnegie Foundation commissioned Abraham Flexner to report upon the medical schools. He issued a devastating account of them in 1910, but made many valuable suggestions, most of which have since been adopted. Dr. Sigerist shows incidentally how great a part in the work has been taken by the American Medical Association, which runs on somewhat similar lines to our own British Medical Association. The amended education has been developed partly on German and partly on British lines, modified to meet the requirements of the United States, where distances are great and the population is more widely scattered than in Europe. Dr. Sigerist calls attention to the higher standard of preliminary education which is now required in the best schools of medicine, and to the necessity of a student having held an intern appointment before he is admitted to the M.D. degree. Examinations, too, are held in less esteem than with us, and a report is required from the teachers as to the general conduct and ability of a candidate during his student career.

Dr. Sigerist also makes some pertinent remarks on the tendency to what, for the sake of convenience, may be called the commercializing of the doctor's calling, and gives a short but pungent account of the various sects which are eating into its heart. Altogether a book to be read and pondered over by every medical man, with the proviso that our own methods are somewhat of a mystery to the author, for he has had no personal experience of them, and they are admittedly peculiar, as they have grown rather than been made. Still, he need not have called William Hunter a surgeon, have placed John Hunter in the Navy, or spelt Sir Thomas Browne without an "e." The translator has done her part so satisfactorily that the book might well have been written in English.

[1] *American Medicine*. By Dr. Henry E. Sigerist. Translated by Hildegard Nagel. New York: W. W. Norton and Co., Inc.; London: H. Milford, Oxford University Press. 1934. (Pp. 316; illustrated. 4 dollars, or 16s. net.)

ENDOMETRIAL TRANSPLANTS

In an exceedingly interesting and important monograph, Dr. HARBITZ of Oslo University records a series of experimental transplantations of endometrium in rabbits.[2] One section is given up to the discussion of his own series of fifteen cases of human endometriosis in laparotomy scars—a condition he believes to be twice as common as formerly. Three of his very beautiful photomicrographs show the formation of a partially cyst-like tumour, due to the growth of gland fragments into the stroma, which correspond with his experimentally produced tumours and further disprove von Recklinghausen's theory of their origin from Wolffian rests. Implantation occurred in one of the author's few cases of ventrofixation, and he makes an enlightening reference to statistics from Hamburg, in which eighteen out of 363 Leopold-Czerny fixations were followed by endometriosis in the scar, whereas 1,201 suspensory operations (the endometrium being undamaged) had not one such sequel.

The most important part of the book, however, is Harbitz's discussion of his own successes in auto- and homoio-transplantation of endometrial tissue in his thirty-one rabbits. His findings that fragments introduced into the pleural cavity have penetrative power, even into bone, and that they extra-pleuralize themselves, explain the occurrence of ectopic endometriotic tumours. Harbitz's figures show how the pieces of endometrium may lodge in a fold of peritoneum, and detach themselves from their source, which, nevertheless, is always differentiated Müllerian tissue. There is, therefore, no need for Meyer's hypothesis of their derivation from coelomic epithelium. Sampson's theory is strongly upheld by the results of these most interesting experiments, as well as very lucidly discussed by their author. The monograph offers a great deal of valuable material for study, and its survey of the literature, though modestly disclaiming completeness, certainly succeeds in its aim of saving labour to others.

BIOLOGY FOR EXAMINATIONS

Messrs. E. R. and A. V. SPRATT have written an ample and competent *Textbook of Biology*.[3] It is issued in attractive form, with an abundance of clear and helpful illustrations, by the University Tutorial Press. The authors state that "for the benefit of those intending to enter for examinations the syllabuses for the Intermediate Science, Pharmacy, and Medical Examinations of the universities of Great Britain, the Higher School Certificate, the Preliminary Medical, and other examinations of a similar standard, have formed the basis for the choice of material." The book is thus acknowledged to have a specific object—the helping of students to pass certain examinations in its subject—and it forms one of a series of volumes which are well known as having successfully achieved a similar aim. Given these objects, conditions, and limitations the task is well performed. The book will serve its purpose, but, unless the students who may use it are going to devote themselves thereafter mainly to the continued study and perhaps the teaching of biology, they will have made unprofitable use of a great deal of time, even with the assumption that the authors, of course, make, that the student will be engaged in the practical observation and dissection of appropriate specimens all the while. This is not the fault of the authors: it is the consequence of the action of examining bodies in prescribing a particular course and

[2] *Clinical Pathogenetic and Experimental Investigations of Endometriosis*. By Hans Fredrik Harbitz. Oslo: Kirstes Boktrykkeri. 1934. (Pp. 400; 70 figures.)

[3] *Textbook of Biology*. By E. R. Spratt, D.Sc., F.L.S., and A. V. Spratt, M.Sc. London: University Tutorial Press, Ltd. 1935. (Pp. 646; 481 figures. 9s. 6d. net.)

method of study and testing the results in a particular way. It is not fair to judge a book for not effecting a purpose for which it was never intended: yet never was there a better illustration than this textbook of the urgent need for reform in the teaching of biology.

It is not in this way that we would have a textbook of biology written. Certainly for those about to enter the medical profession (except, as has been said, for certain examination purposes) it is misdirected in its proportions and point of view, in spite of the fact that care is taken to include such organisms as the tapeworm and the malaria parasite. We doubt if the methods here exemplified will often rouse either a living interest in the subject or an interest in the living subject. Here are some thirty or more types from the amoeba to the rabbit, and including several plant types, described minutely in succession. More than 400 out of some 600 pages are devoted to this structural examination. Less than a hundred pages may be said to be given to physiological and biochemical matters; and there are seventeen devoted to "heredity, variation, adaptation, and evolution," and of these seventeen more than one paragraph—for example, that dealing with the inheritance of acquired characters—is misleading. We do not doubt that the authors are correct in supposing that their students will be tested, both quantitatively and qualitatively, with proportionate overemphasis on structure. But biology, we have always been given to understand, is the science of life, and, that being so, it should be taught in a different way, at any rate to the medical student.

MAN AND THE MACHINE

Man and the Machine[4] represents the personal opinions of three small groups of writers on the good and evil of modern mechanization. One group consists of employers, another of the employed, and the third, of more detached "observers." The editor, Mr. Hubert Williams, supplies an introduction in which he points out that the opinions of the employers are inclined to run very much on all fours. The same may be said for the views of the wage-earners, but unfortunately there is no sort of agreement between the two sets of views, and without it there is little hope of industrial peace. The wage-earners are convinced that the machine has not added to the sum of human happiness. A miner deprecates the substitution of coal-cutting machinery for hand labour. An engineer takes the exaggerated view that mechanization "has been responsible for the intensification of anguish, both mental and physical torture, never before experienced in the day-to-day lives of millions." A steel worker considers that, by the development of science, the engineering worker "has been reduced from the aristocrat of industry to a level which is not commensurate with his skill," while a cotton operative points out that, owing to the adoption of the principle of "more looms per weaver," automatic looms, and other labour-saving devices, thousands of highly skilled operatives walk the streets, vainly looking for work. A trade union representative contends that a partial solution of the problem will be attained by the adoption of the forty-hour week, without reduction of pay; but the most convincing arguments of all are those given by an economist, Mr. E. M. F. Durbin. He maintains that the only hope of a higher standard of living is a still greater development of machine production. It is true that in many cases the installation of machinery has created a considerable volume of unemployment in an industry, but in the long run it leads to an increase in the real demand for labour, coupled with a reduction in the hours of work. He sums up by claiming that the machine can be used almost indefinitely for the benefit of human life and happiness if it is properly understood and properly controlled. His article may be cordially commended to the attention of everyone who is taken aback by the evident hardships sometimes induced by the advent of the machine.

[4] *Man and the Machine.* Edited by Hubert Williams. Preface by J. B. Priestley. London: George Routledge and Sons, Ltd. 1935. (Pp. 207. 6s. net.)

WATER METABOLISM

"Water Metabolism in Health and Disease," by Dr. HELLMUT MARX,[5] is the thirty-third volume of the valuable series of monographs on plant and animal physiology edited by Parnas, Ruhland, and others. The author deals chiefly with the exchange of water and of chlorides, and discusses both the internal exchange between the circulating fluids and the tissues and the external exchange between the body and its surroundings. In the longest section of the book the water exchange of each of the important organs is discussed separately, and in a later section we find a full discussion of the manner in which the water and salt is regulated by the internal secretions. A particularly full account is given of the existing knowledge regarding the manner in which the hypophysis-hypothalamus system regulates water and salt metabolism. In general it may be said that the physiology and pathology of water and salt metabolism are only imperfectly understood, but that the subject is of fundamental importance in very many clinical conditions. Its bearing upon such conditions as nephritis, oedema, and shock is obvious, while recent advances indicate its significance in epilepsy, fever, and many other conditions. The author has collected his information from an exceptionally wide range of sources, and has succeeded in covering a number of diverse problems, many of which are obscure, in a volume of just over 300 pages. The monograph provides a clear and concise account of a difficult subject, and will be of much value to a great variety of workers.

INHERITED DEAFNESS

Rejecting the data collected by Fay and other non-German investigators, Professor M. SCHWARZ of the ear, nose, and throat clinic at Tübingen has written a pamphlet on Inherited Deafness.[6] It is based on German literature, mainly on the classification of defects in hearing and pedigrees of familial deafness collated by W. Albrecht. The structure and function of the ear are briefly reviewed, and there is an elementary account of Mendelian genetics. The author distinguishes five types of deafness: recessive deaf-mutism; heritable deafness due to abnormalities of the labyrinth and the organ of Corti; defective hearing due to cretinism; otosclerosis; and otitis media. Clinical symptoms, differential diagnosis, and heritability are discussed in some detail. Homozygous recessive deaf-mutes are to be compulsorily sterilized, and an increase in the heterozygous population, estimated at 1,400,000, is to be checked by prohibition of marriage of affected individuals who are closely related. Voluntary sterilization is advocated in cases of dominant defects of the inner ear. Owing to lack of knowledge of the relative importance of nature and nurture in cases of defective hearing due to cretinism, compulsory sterilization is not sanctioned. The part of inheritance in cases of otosclerosis is also somewhat obscure, but voluntary sterilization is

[5] *Der Wasserhaushalt des Gesunden und Kranken Menschen.* By Dr. Hellmut Marx. Berlin: J. Springer. 1935. (Pp. 335; 52 figures. RM. 27; geb., RM. 28.40.)

[6] *Ererbte Taubheit.* By Professor Dr. M. Schwarz. Leipzig: G. Thieme. 1935. (Pp. 56; 23 figures. M. 4.)

within the law on the grounds of the danger to health due to an anticipated increase in the severity of the defect. Although there is evidence in favour of heritability of otitis media, the environmental factors play too important a part to justify an application of the Nazi sterilization laws. The necessity for an elaborate diagnosis and anamnesis in cases of deafness is stressed.

Notes on Books

Diabetes Mellitus: A Clinical Study, by Dr. T. H. OLIVER (Bale, Sons and Danielsson, 3s. 6d.), is not in any way a complete manual of diabetes or even a short practical guide to treatment. Dr. Oliver has set out to consider his clinical experience of diabetes in the last fifteen years and to explain the different clinical types on a working physiological hypothesis. He considers the two factors mobilization and utilization of carbohydrate separately, and tries to discriminate between different clinical types on this basis. The book is useful in stressing the factors other than pancreatic (insulin) deficiency, which modern progress shows often to be associated with the "diabetic" condition of hyperglycaemia and glycosuria.

The eighth edition of Mr. BISHOP HARMAN'S *Aids to Ophthalmology* (Baillière, Tindall and Cox, 3s. 6d.) keeps to the high standard which he has set in previous editions. The text has been revised in the light of new methods of investigation and treatment. The standards of vision required of candidates wishing to enter various services are of the greatest use for reference. This little book meets the requirements of an ophthalmic house-surgeon or a general practitioner, while the medical student, if he masters its contents, will not fail to satisfy his examiners.

Dr. L. A. BORRADAILE'S *Elementary Zoology for Medical Students* (Milford, Oxford University Press, 10s. 6d.) was first published twelve years ago, and has now reached a third edition. This book, it may be recalled, is intended for students who need an account of the types which are studied in preparation for first medical examinations. In the present edition one or two types have been omitted and others appear for the first time; the chapter on embryology has been expanded.

Mr. E. SAMSON, the author of *Common-Sense Dentistry*,[7] seems to be a humorist who would have us take him seriously. He pokes his fun at everybody who has tried to elucidate the problem of dental caries, and, to his own satisfaction, reduces each particular theory to an absurdity. His remedy for the chaotic ignorance of the dental profession is a Government inquiry and a national laboratory of dental research. His object is to stimulate the profession to greater efforts at achieving prevention, and to this end he has used his undoubted sense of humour. But here we find his humour strained and cumbersome, and his remedy ignores the existence of the Medical Research Council. Some, like Professor Gilmour, may, in a leisure hour, be roused to a keen desire for greater knowledge; others, we fear, will merely be irritated.

It is pleasant once more to read LUIGI CORNARO'S treatise on temperance and sobriety,[8] though it seems almost a scandal for the publishers to issue it under such a catchpenny title as "How to live a Hundred Years and Avoid Disease." Cornaro was a charming Venetian nobleman who died of old age in 1566. He wrote a wise little essay when he was 81 on the value of a sober and orderly life at a time when rere-suppers were the fashion, and it was a saying that "rere suppers sleyeth many." His treatise caught the eye of George Herbert the poet, who made it speak English, and afterwards of Addison, who founded upon it No. 195 of the *Spectator*.

[7] *Common-Sense Dentistry (A National Necessity)*. By Edward Samson, L.D.S., R.C.S. London: J. S. Cottrell and Co. (Pp. 100. 7s. 6d. net.)

[8] *How to Live for a Hundred Years and Avoid Disease*. A Treatise by Luigi Cornaro, the sixteenth century Italian centenarian. Translated by George Herbert, with an introduction by George Cooke. Oxford: The Alden Press. 1935. (Pp. 63. 2s. 6d. net.)

Preparations and Appliances

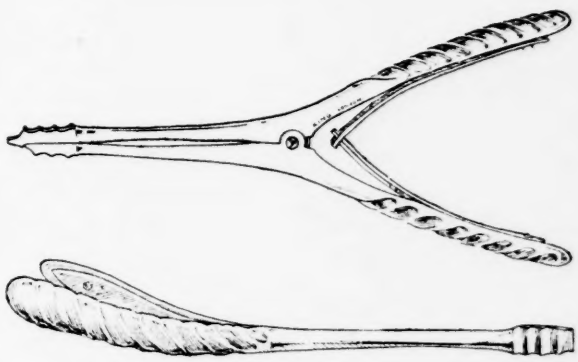
COIN PLEXIMETER

Dr. DAVID A. HERD (Stoke-on-Trent) writes: I have for some time used this small instrument, and believe it may be of use to other chest clinicians. Previously the "coin test" for the presence of pneumothorax or cavity was carried out by an assistant tapping with two coins on the patient's chest. It will be seen that my device dispenses with the assistant, and can be easily operated by the physician himself with one hand. This simple contrivance is now being made by Messrs. Down Bros., Ltd., London.

MOUTH OPENER FOR THE INSERTION OF AIRWAYS

Dr. ARTHUR P. GORHAM, anaesthetist to the Royal Hospital for Sick Women and Children, Bristol, writes: I have designed this opener for use in nose and throat work, where, after a post-nasal swab has been inserted, an airway is placed in position, and the anaesthetic delivered through it.

It is used as follows. The anaesthetist, standing on the left of, and facing, the anaesthetized patient, inserts the opener between the molar teeth and opens the mouth, using his right hand only, and holding the airway connected to the anaesthetic apparatus in his left hand. The surgeon, in a similar position on the right of the patient, inserts the post-nasal swab, holding it in position with a Watson-Williams



palate retractor and forceps, while the anaesthetist inserts his airway. The opener is then quickly and easily withdrawn.

The opener can be used as an ordinary gag, and presents three advantages. (1) The length of the shank and the curvature of the handles make it exceedingly easy to operate. (2) Being inserted at right angles to the jaw it does not lie along the face, and is therefore not difficult to close, as are the majority of gags. (3) It does not catch in the airway, or tend to withdraw it, neither does it catch the tape of the post-nasal swab. The overall length is 7½ inches, and it is made in stainless steel by A. Charles King, Ltd., of 34, Devonshire Street, London, W.1. No ratchet is fitted, as it is not intended for keeping the mouth open for any length of time.

Emmenoplex (Glaxo Laboratories) is a standardized preparation of emmenin, the orally active oestrogenic substance that was demonstrated in 1929 in the human placenta by Professor J. B. Collip and his co-workers in Montreal. There is a considerable literature on this subject, and favourable clinical reports have been published regarding the utility of emmenin in the treatment of dysmenorrhoea.

Veganin brand (W. R. Warner and Co., Ltd.) tablets contain codeine phosphate, phenacetin, and acetyl-salicylic acid. The combination is recommended for the relief of pain in a wide variety of conditions.

SWALLOWING FOREIGN BODIES FOR A LIVELIHOOD

BY

I. LLOYD JOHNSTONE, *M.C.*, M.B., D.O.

A case of unusual surgical and psychological interest came under my notice in January, 1923, when I was surgical dresser to Mr. John Murray at the Middlesex Hospital. A man was admitted for the removal of three three-inch nails from his small intestine. That it was not the first time that he had been in such a case was evident from his profusely apologetic attitude to the surgeon for troubling him again, and from the appearance of his abdominal wall. It was a mass of scars, and was thrown into hills and valleys by small herniae scattered among the scars.

As dresser to the case it was my duty to inquire into his history. He gave an account of a round dozen of operations for the removal of foreign bodies from the abdomen. One of these had been at the Middlesex, so I took the trouble to look up the records and it proved to be as he described. I found a record also of an operation for double inguinal hernia which he had not mentioned, but acknowledged on being reminded of it. Before leaving hospital he wrote his memoirs and handed them to me as a reward for my interest in him. I have often thought them of sufficient interest to publish, and am stimulated to do so now by an interesting article on "Five Hundred Foreign Bodies in the Stomach," by R. Stewart Kennedy, published in the *British Medical Journal* of June 22nd.

Before giving his history in his own words it should be explained that the way he turned his ability to swallow objects, such as cutlery, nails, and screws, to pecuniary advantage was to take wagers that he would swallow the article or articles exhibited. When the "book" was large enough to satisfy him he would proceed to carry out his boast and collect the bets. He stated that he had always been able to pass anything up to two and a half inches in length. The public-house was always the stage for the performance, and doubtless a drink or two and an intimate knowledge of the hospitals of London made him reckless in tackling larger objects.

A Personal Narrative

The account of his escapades is given in his own words and spelling.

Things I have Swallowed Since 1905/7/9.

I begun my occupation in swallowing 2 pennies and was admitted into Thomas's Hospital, in City of London, under Mr. Making and was there 14 days and discharge quite well.

On the 26/11/1905, I was admitted into Westminster Hospital for swallowing 3 bits of tin, 3 Large screws, and 3 Large Nails size 4½ inches, operated on by Mr. Stoner in Luke Ward and was their 5 Weeks and discharge quite well.

In March 3/3/1906 I was admitted into St. Marys and operated on by Mr. Earnest Lane in Forester Ward for swallowing 4 Screws 4 Nails and 4 stones, Size of Nails and screws were 3 inches and the stones were this Size. [1 cm. diameter, I.L.J.] I was there 4 weeks and sent to a Convalescent home, and then discharge quite well again;

In Jan 6/1/1908 I was admitted into Charing X Hospital for swallowing half a Table knife, operated on by Mr. Fenwick in Paget ward and was there 6 weeks and discharged quite well.

Second time in this Hospital, on 16/4/1910, I was admitted into Clayton ward [? St. Thomas's Hospital—I.L.J.] and operated on by Mr. Adams for a Tin Whistle and a Pea shooter and was there 5 weeks and discharge well; When I went to Thomas's Hospital to see the House Surgeon and told him what I have swallowed he burst out laughing and said I was pulling his leg; Just to make sure, the House Surgeon had me X Rays at once, and when he discovered what I had inside my Stomach he had me up into the Operating Theatre and operated on at once, without delay. that was about 1.30 p.m. I was admitted at 12.45 p.m. 16/4/1910, so you see they lost no time.

On 24/6/1912 I was Admitted into Barts, Henry Ward, and operated on by Mr. D'Arcy Power for 5 Large Brass Screws, 6 Large Nails which was french nails Size 2½ inches and discharge quite well again and sent to Bognor for 5 weeks in Hospital 4 weeks Bognor 5 weeks.

In 22/12/1912 I was admitted into Guys Hospital for swallowing 6½ inch Nail which took 3 operations to remove, Before being operated on there was a bet between the Night Nurse and the Student as were the 6½ inch lied, one said it was in the transfered Coln, and the Night Nurse said it layed in the Coln, to make sure Mr. John Dunn had me X Rayed and Skiagraphed and the Skiagraph showed that it was in the Coln, and then I was operated on straightaway. The Night Nurse won the Bet which was £5 0. 0 which my Dresser Mr. Taylor had to pay up.

I was admitted into the Royal Free Hospital in Marsden Ward and operated on for a Spoonhandle, and a Brass Button —the operation was performed by Mr. Pannett, their 6 weeks discharge quite well again—

I was admitted into the London Hospital in Wellington Ward operated on by Mr. Kidd for a fountain Pen, and handle of a Fork and was there 6 Weeks and discharge well.

I went to Cleaveland Street Infirmary and was operated on by Mr. Gamwill the Medical Supert of the Infirmary, the very same night I entered the Infirmary—that was on 26/5/1914 for 6 Larg Safty Pins and 5 Ladies Hair Pins and they gave me up for Dead. I never came too till Wednesday morning, operated on Monday and then came around alright. In 8 weeks and discharge quite well.

1916: I went to Middlesex Hospital when I swalld Pencil case & one nail. operation performed by Mr. Murray in Murray and now operated on the 12/1/23 in Pepys Ward for 3 Nails 3 inches Long, in Pepys Ward 3 weeks and discharged 31/1/23—admitted into Middlesex Hospital 8/1/23.

I defy contradiction

I remain

(Signed) X Y Z

Commentary

So far as I can remember no one remonstrated with the patient for the damage he caused himself and the trouble and expense he was to the hospitals, but he was almost convincing in his promises never to engage again in the practice of his "occupation." A few months later I encountered him standing with a sandwich board at the corner of Tottenham Court Road and Francis Street. Mistaking me for a University College Hospital man he soon betrayed the fact that he had favoured that hospital with a visit since he left Middlesex. Being fairly caught, he protested that he would never do it again, and he showed me a Salvation Army badge to persuade me that he had really reformed. I have not seen or heard of him since that day. Without any disparagement to the Salvation Army, it is quite possible he has been seen again at one or more of the London hospitals.

This case differs from the "usual foreign body cases" mentioned by Kennedy, "either hysterical or suicidal," and from the case he so ably describes. Though there seems to have been more or less composure and purpose in his acts of swallowing rather large foreign bodies, it is evident he was conscious of delinquency. I must leave it to the psychologists to classify his condition, and to anyone interested at the various hospitals mentioned to verify the statements thus vouched for by the man himself. That he had undergone fully that number of abdominal operations was evident from the scars without and adhesions within his abdomen.

I am indebted to Mr. John Murray for permission to publish the case.

G. Iesu (*Rev. di Chir.*, May, 1935, p. 254) records his observations on fifty patients, aged from 18 to 68, on whom he carried out a series of investigations to determine whether the type of anaesthetic and the gravity of the operation had any effect on the amount of calcaemia in the post-operative period. From the results obtained he concluded that there was no relation between operative shock and calcaemia, or between the character of the anaesthesia and calcaemia, as he found that the calcium in the blood (determined by Kramer and Tisdall's method) showed only small oscillations within normal limits. He also found that febrile states had no effect on the amount of calcaemia either before or after operation.

LUNACY AND MENTAL DEFICIENCY IN ENGLAND AND WALES

BOARD OF CONTROL'S REPORT

The twenty-first annual report (Part I) of the Board of Control for the year 1934,[1] just issued, is arranged in three main divisions—"Mental Disorders," "Mental Deficiency," and "General."

Mental Disorders: Numbers

Turning first to mental disorders, the returns made to the Board show that on January 1st, 1935, the total number of persons suffering from mental disorder notified as under care in England and Wales was 152,089, giving an increase of 1,823 over the figure for January 1st, 1934. This increase may be compared with the average increase for the five years ended January 1st, 1935, of 1,736. The Board again draws attention to the fact that for purposes of comparison this increase is merely the excess of admissions over the combined deaths and discharges, and has no necessary connexion with the actual incidence of mental disorders among the general population. As will appear later, the death rate in 1934 fell to 6.6 per cent., the lowest figure ever recorded; and further, such factors as the numbers admitted as voluntary patients and the amount of available accommodation have a direct bearing on the numbers notified as under care. What increase there is, in fact, lends no support to the alarmist statements which, the Board states, find their way into the Press from time to time. The percentage distribution of the sexes—males, 44.2, females, 55.8—is the same as in the preceding year.

It should be mentioned at this point that the total numbers notified as under care include not only patients in public and private mental hospitals, in the naval and military hospitals, in the State Criminal Lunatic Hospital at Broadmoor, in nursing homes, and in private single care, but also patients in public assistance institutions and municipal general hospitals, as well as those in receipt of outdoor relief. It is necessary to bear this in mind when considering the statistics of the "movements" of patients (admissions, discharges, transfers, and deaths), because, owing to the unfortunate absence of adequate information concerning the 14,944 patients in public assistance institutions and municipal general hospitals, and the 4,043 patients in receipt of outdoor relief, these have to be omitted from the Board's analysis of the total figures. The immediately following facts concerning the total number of patients are, however, available. As to the class including "service" and "ex-service" patients, 15,052 were private patients and 136,160 were rate-aided. Criminal patients numbered 877, giving a decrease of 12 during the year; while as regards status, 4,258 of those under care on January 1st, 1935, were voluntary patients; 343 were temporary patients; and 147,488 were certified patients.

Movements of Patients

Turning to the movements among the patients, with the exceptions noted above, on January 1st, 1934, there were resident 130,968, and on January 1st, 1935, there remained 133,552 under care. During the year 26,819 were admitted directly, and there were also 2,765 indirect admissions, including re-gradings (from voluntary or temporary class to certified, etc.); 8,622 were discharged as recovered, 5,734 as improved, 1,407 as not improved, 198 by operation of law, and 22 as not now insane, whilst 2,686 were discharged to other care. During the year 8,781 patients died.

With regard to the foregoing figures the following observations may be quoted: first, the rate of admissions per 10,000 of the population aged 16 years and upwards in England and Wales was 8.82 (males, 8.16, females, 9.4), and shows a decrease of 0.35 on the previous year. The *first* admissions during the year numbered 20,725 (77.3 per cent. of all the direct admissions), and were composed of 4,712 voluntary patients, 776 temporary patients, and 15,237 certified cases, giving the following percentage amongst the first admissions: voluntary, 22.7; temporary, 3.8; certified, 73.5. The uses of voluntary and temporary treatment are dealt with in greater detail in the analysis of the county and borough hospitals. As to discharges and departures, the number of certified and temporary patients discharged and voluntary patients who departed from statutory care was 15,763, and of these the 8,622 discharged as recovered yielded a recovery rate, calculated on the direct admissions, of 32.1 per cent. If to these recovered there be added the discharges as relieved and not improved, the total absolute discharges and departures formed 59.3 per cent. of the direct admissions.

Finally, the deaths (males, 4,101, females, 4,680) were less by 627 than those of the previous year. The death rate—6.68 of the daily average number resident—was 0.57 below the rate for 1933, and 0.03 below the previous lowest record, that of the year 1930.

County and Borough Mental Hospitals

On January 1st, 1935, the county and borough mental hospitals (containing about 94.7 per cent. of all notified patients), of which there are now one hundred, with accommodation in recognized bed space for 124,162 patients, had on their books the names of 126,102 resident patients—664 males and 1,276 females in excess of proper bed provision. Only one new hospital (for Southend and East Ham) is in course of construction, and though plans of proposed adaptations of or additions to some fourteen public mental hospitals have been approved, these will only provide 1,177 additional beds, and even then are not likely to be ready for occupation for four or five years.

Of the total number under care in these hospitals on January 1st of this year, 2,940 were voluntary patients, 274 were temporary patients, and 122,888 were under certificates. As compared with the corresponding date in 1934 the numbers show increases of 925 in the voluntary patients and of 112 and 1,088 respectively in the temporary and certified patients. The increase in voluntary patients is notable. Private patients numbered 9,107; rate-aided 116,925; and criminal patients 70. During the year under review there were 23,397 direct admissions, of whom 4,078 were voluntary patients, 697 temporary, and 18,622 certified. As compared with the previous year these figures show increases of 1,117 in the voluntary and 300 in the temporary admissions, but a decrease of 513 in those of certified status. The increase in the voluntary admissions, the Board states, is at last reflected in a marked drop in the number of admissions under certificate. Only two of the public mental hospitals received no voluntary patients, and further, the proportion of voluntary patients among the admissions failed to reach 5 per cent. in only four hospitals, whereas there were fourteen such in 1933. A tabular statement is furnished in the report as to individual hospitals arranged according to grouped percentages of voluntary admissions—under 5 per cent., 5 to 9 per cent., etc., and so on, to 45 per cent. and upwards. This shows that in nineteen hospitals the percentages ranged between 5 and 9; in twenty-six from 10 to 14; in twenty-eight from 15 to 24; in nine from 25 to 34; in four from 35 to 44; and in five from 45 upwards, Cardiff, Portsmouth, and Swansea showing percentages of 50, 67, and 68 respectively. (The Maudsley, which only receives voluntary patients, and the percentages of Ewell (79), Scalebor Park (59), and the City of London (61), are not included because of special conditions which would make comparison with others fallacious.) It is clear that the advantages of this part of the Mental Treatment Act, at least, are becoming increasingly manifest, even though, owing to a variety of local conditions, the extent to which the voluntary system is operated is as yet extremely variable. With regard to temporary treatment, no figures are given other than the number (697) admitted during the year, though the Board

[1] Lunacy and Mental Deficiency. The Twenty-first Annual Report of the Board of Control for the Year 1934. Part I. London: H.M. Stationery Office. 1935. (Pp. 78. 1s. 6d. net.)

regards as encouraging the fact that the number of hospitals making no use of this provision has steadily declined from forty in 1932 to twenty-two in 1934. It is further able to state that during the current year a definite rise in the proportion of temporary patients is observable.

During the year 12,991 patients were discharged or departed from county and borough mental hospitals, and of these 3,183 were voluntary patients, 260 temporary patients, and 9,548 were patients of certified status. A table is supplied from which the following figures may be taken. Of the voluntary patients 1,523 were discharged as recovered, 1,163 as relieved, and 497 as not improved; of the temporary patients 150 were discharged as recovered, 81 as relieved, and 29 as not improved; whilst of the certified patients 5,878 were discharged as recovered, 3,134 as relieved, and 536 as not improved. The whole number of discharges gives a recovery rate calculated on the admissions of 32.3 per cent. (males, 30.1, females, 33.9). The report does not attempt any comparative analysis of the discharges as between the voluntary, temporary, and certified cases, possibly for the reason that at this stage of development of the provisions for voluntary and temporary treatment the results might well prove fallacious and misleading.

Turning to the deaths in county and borough mental hospitals during 1934, which numbered 8,781 (males, 4,101, females, 4,680), and gave the lowest death rate ever recorded, the Board states that the time that elapses between the receipt of the mortality statistics for any given year and the preparation for publication of its report is too short to permit of the compilation of a detailed summary. It does, however, furnish a table covering the deaths in county and borough mental hospitals during 1933, and with regard to 1934 some account of the mortality from infectious diseases, and also of the incidence in these hospitals of tuberculosis, the enteric group, dysentery, erysipelas, influenza, pneumonia, etc. Tables deal with the first three of these, showing incidence and deaths for each year since 1925, and it is satisfactory to note in tuberculosis the steady fall in the ratio per 1,000 of patients resident—from 11.8 in 1925 to 6.6 in 1934. During 1934 there was a great reduction in the incidence of the enteric group, but at the moment the Board regards this as a freak figure resulting from unknown factors. The incidence rate for dysentery, rather variable from year to year, shows no significant change during the last decade.

Mental Disease in Registered Hospitals and Licensed Houses

On January 1st of this year the registered hospitals contained 2,461 resident patients, of whom 544 were voluntary, 36 were temporary, and 1,881 were certified patients. The total number resident in the previous year was 2,422. During the year under review 938 patients were admitted to these hospitals, of whom 65 per cent. were voluntary and 5.9 per cent. temporary patients, and at none of them did the proportion of voluntary patients fail to reach 50 per cent. At Cheadle Royal, St. Andrew's, Bootham Park, and the Retreat the proportion was between 60 and 69 per cent.; at the Lawn, the Warneford, and Bethel between 70 and 79; and at Bethlem 80 per cent. As to temporary treatment the highest percentages were at St. Andrew's and Barnwood House, being 10 per cent. and 13 per cent. respectively. In their avoidance of resort to certification the Board states that this constitutes a remarkable record, and indicates a service of which the hospital authorities may be justly proud, and which should do much to promote early treatment. The percentage of total departures and discharges to the admissions was 70.9, and that of recoveries alone was 33.2 per cent., or 1.1 per cent. greater than that for the county and borough hospitals. During the year 211 patients died, giving a death rate calculated on the average number daily resident of 8.8 per cent.

The total number of patients in licensed houses rose by only eleven, from 2,862 on January 1st, 1934, to 2,873 at the beginning of this year. During the year 1,272 were admitted, of whom 57.2 per cent. were voluntary, 7.1 per cent. temporary, and 35.7 per cent. certified patients. The percentage of departures and discharges to admissions was 72.2, and of recoveries alone 27.0. Deaths numbered 269, and the death rate calculated on the average daily number resident was 9.4 per cent.

The Board's report on mental disorders ends in a half-page reference to certified patients in public assistance institutions and municipal general hospitals. As already mentioned, these patients, certified under the Lunacy Acts, numbered 14,944 on January 1st of this year; but, the Board states, these figures by no means represent the total number of mental cases in these institutions. The Board observes that notwithstanding the need for further accommodation in county and borough mental hospitals, there has been no increase in the number of visiting committees availing themselves of the facilities offered by Section 26 of the 1890 Lunacy Act for providing accommodation in public assistance institutions for selected patients.

Mental Deficiency in 1934

The Board's report on mental deficiency opens with the numbers under care, but a clearer view of the position will be obtained here by commencing with "ascertainment." The actual returns sent in by the local authorities for 1934 show that on January 1st, 1935, the number of defectives, whether "subject to be dealt with" or not, reported to these local authorities was 108,382, giving an increase over the previous year's figures of 1,943; or, otherwise expressed, a proportion per 1,000 of general population of 2.69, as against 2.65 for the corresponding date of 1934. To the total figure for January 1st, 1935, should be added perhaps 2,148 children between the ages of 14 and 16, concerning whom the local authority has no liability, but who have been informally reported to the local authority. This addition would raise the total number known to local authorities to 110,530, or 2.74 per 1,000 of general population. Disregarding for the moment this small additional number, the Board, comparing the proportion of 2.69 per 1,000 of population with the Wood Committee's estimated figure for the whole country of 4.52 per 1,000, states: "It appears that, on an average, local authorities have still taken cognizance of only a little more than half the number of defectives in their area for whom the Wood Committee estimated that they are, or may at any time become, responsible."

The Board then refers to the figures of the 123 local authorities given on pages 44, 45, and 46 of the report, showing for each the proportions "reported," "ascertained to be subject to be dealt with," and "in institutions." The proportions of these reported cases range from 0.68 per 1,000 (Huntingdon County) to 7.05 per 1,000 (Cardigan County). The Board concedes that some local variations do, without doubt, occur; but states that on examining the figures it is impossible to believe that the low ascertainment shown in many areas reflects the actual incidence of mental defect. The Board considers that the explanation lies mainly in the efficiency of the methods of ascertainment. Of most immediate importance, however, the Board considers the ascertainment and notification of children through local education authorities, and the pressing need for further legislation. In 1934 there were 3,488 notifications of children by local education authorities, as compared with 3,543 the year before, an actual falling off of 55. The Board specifies thirty-five local authorities which have had only five or less than five cases notified to them by local education authorities, in several of which areas—towns of considerable size, such as Gateshead, Halifax, Huddersfield, etc.—a low figure, continued over two years, suggests to the Board some failure of the working of the Education and Mental Deficiency Acts.

A statement from the Nottingham County Council is quoted as depicting one instance of the situation which arises from this failure, which the following excerpts from the Board's introductory observations put very clearly:

"A local mental deficiency authority has no power to deal with children between the ages of 7 and 16 unless they have been notified by the local education authority. The latter authority in its turn can only notify ineducable children and feeble-minded children who are leaving special schools or classes, except where a child cannot be taught in a special school without detriment to the other children or the Board of Education certify that there are 'special circumstances,' exceptions which obviously can only apply to a limited class. When the Mental Deficiency Act, 1913, was drafted it was assumed that children of subnormal mentality, who were not so low-grade as to be ascertainable before the age of 7, or excluded from school as ineducable, would ordinarily be sent to special schools. But for financial and other reasons special schools have not developed as was anticipated in 1913. Indeed, in rural areas and small towns special schools are now recognized to be impracticable; and even in the larger towns there is sometimes a tendency to merge the feeble-minded and the educational defective with the backward children for educational purposes without certification. . . . The practical result of the present position is that large numbers of defective children, who have been retained in ordinary public elementary schools, cannot be notified when they leave at the ordinary leaving age, although their mental defectiveness is well known to their teachers and to the school medical officers. The local mental deficiency authority can do nothing till these children reach the age of 16, and then only if they are 'subject to be dealt with' under one of the other provisions of the Act. . . . What is really happening is that feeble-minded children are being left at a most critical period in their lives without the supervision and control which the Legislature intended to give them. Even when they emerge from limbo at the age of 16 nothing can be done for them by the local mental deficiency authority unless they are neglected or unless their antisocial behaviour brings them into conflict with the law. Sooner or later those who are unfit for community life will find their way into institutions after the opportunity for continuous care and training has been lost, and many will have hardened into delinquent and anti-social ways. . . . Legislation will be needed to fill this gap, and the need for filling it is becoming more and more generally recognized."

Bearing on the same point, some tables are included in a brief statement entitled "Mental Defect and Crime," one of which shows that of the 334 criminal defectives dealt with in 1934 only 32 per cent. had been previously ascertained by the local authority; 28.8 per cent. had attended special schools; the remaining 71.2 per cent. were, or had been, pupils in elementary schools. Such facts emphasize only one aspect of the essential importance of an accurate and co-ordinated ascertainment of the number of defectives, measured by a uniform standard, of the defectives in the country. Obviously, without such ascertainment the question of whether there is an actual increase in the incidence of mental defect cannot be settled, even though the Board states:

"If the reductions in the number of notifications by the local education authorities reflected any diminution in the incidence of mental defect, it would be most encouraging. Unfortunately, however, there is no evidence of any such diminution; on the contrary, there is some indication of an actual increase."

Defectives under Care

Of the total number of defectives (108,382) officially reported to local authorities, 82,740 were "subject to be dealt with," and of this number 74,691 were under care—that is, either in institutions provided under the Mental Deficiency Act (37,987), or under guardianship or notified (3,327), or under statutory supervision (33,377). Of the number in institutions 1,268 were in State institutions (Rampton and Moss Side); 26,782 were in certified institutions; 9,128 were in approved institutions (public assistance institutions approved by the Board); 219 in certified houses (in which defectives are received by the owner for private profit); and 590 in approved homes (in which defectives are received and supported wholly or partly by voluntary contributions or for private profit). A further matter to which the Board directs attention concerns the increase during the year from 11,100 to 11,714 in the number of defectives subject to be dealt with who are in receipt of poor relief, indoor and outdoor. The shortage of accommodation still existing in certified institutions no doubt accounts for the increase in the number cared for in public assistance institutions, but with regard to the increase in the number in receipt of outdoor relief the Board expresses some surprise, and states that the fact that defectives continue to receive relief through the Public Assistance Committee rather than the Mental Deficiency Committee does not appear to it to accord with the principles of the Local Government Act, designed to enable local authorities to deal with defectives on account of their mental condition rather than their poverty. The authorities singled out for mention in this respect are Hull, West Riding, Devon, Brecon, and Kent.

With regard to the provision of institutional accommodation for defectives, the Board observes that although during the last four years, because of the financial position, it has put no pressure on local authorities, it is remarkable that the rate of progress in this respect has been well maintained, 2,026 additional beds having been provided by local authorities in certified institutions during the year, while several big schemes are well under way and others in course of development. The steadiness of this advance means, the Board concludes, that local authorities have come to realize that it is as much a social obligation to provide accommodation for defectives who are unfit to be left at large as to provide for the blind or the tuberculous.

Under the slightly ambiguous term of "community care," meaning by this the various forms of care and of supervision provided altogether outside institutions for defectives—whether in their own homes or with others under guardianship or on licence—the Board discusses such matters as the training and employment of defectives; occupation centres, industrial centres and classes, clubs and evening classes; and licence, guardianship, and statutory supervision. Concerning the last-named provisions, the defectives on licence increased during the year by 316 to 2,094; those under guardianship by 274 to 3,083; and those under statutory supervision by 1,456 to the 33,377 already mentioned. It is of interest to note in this last connexion that by January 1st, 1935, the number of defectives under voluntary supervision, which includes defectives who are not subject to be dealt with but in whose case some arrangement has been made for friendly visitation, amounted to 23,544.

Other Matters

The total net cost, excluding capital expenditure defrayed out of revenue, for each of the two groups of institutions as a whole for the year ended March 31st, 1934, was: for mental hospitals, £8,205,729, with an average cost per patient per week of 25s. 7.1d.; and for certified institutions for defectives, £972,834, with an average cost per patient per week of 28s. 0.1d.

An arrangement which the Board welcomes, and which is the first of its kind between a local authority and one of the great teaching hospitals in London, was made in November of last year between Middlesex County Council and the governors of Westminster Hospital. In consideration of a grant of £9,500 towards the cost of erection of their new buildings in Horseferry Road, the governors have agreed to provide beds, etc., for the reception of three male and three female voluntary or temporary patients under the Mental Treatment Act, and to undertake their nursing and treatment, etc., treatment to be in conjunction with one of the medical superintendents of the Middlesex county mental hospitals.

An account of the researches and routine laboratory investigations carried out by sixty-two public mental hospitals, four registered hospitals, seven institutions for mental defectives, and at the Central (London County) Pathological Laboratory, closes Part I of the annual report. In all, seventy-four communications, of which twenty were limited to routine laboratory investigations, were received by the Board. The Board's account of these contributions is in the form of a brief description of the investigations completed or still in progress, and short statements of the results, with occasional comment. The researches are spread over a wide field, and many will doubtless be published independently in full, when their scientific value may be assessed.

British Medical Journal

SATURDAY, SEPTEMBER 21st, 1935

MEDICINE AND THE LEAGUE OF NATIONS

Those who should know tell us that the League of Nations stands before the crisis of its fate. Either it is about to accomplish the greatest task ever set an international organization, or, in Mr. Lloyd George's words, "It may serve some useful purpose as an international bureau, but as an association of nations to establish right and peace on a basis of justice it is doomed." In common with the vast majority of their fellow countrymen, members of our profession earnestly desire that the League should emerge from this ordeal with its prestige enormously enhanced. If the League scores a great political triumph, then, since nothing succeeds like success, the prestige of its scientific and technical organizations will reap the advantage. But if the League fails politically, journalists will speak ill of it and the man in the street will despise it. In the event of political success, professional support of the technical organizations will of course be essential. In the event of political failure something more than professional co-operation, something akin to enthusiasm, will be needed.

We doubt whether the importance of the League's medical work is generally realized in the profession. Most of us know that the Health Organization at Geneva has from time to time appointed committees of experts who have made reports on clinical, hygienic, and bacteriological problems. Most of us know that the Organization issues periodical statistical reports on the prevalence of epidemic diseases and an International Health Year Book which collates information respecting the public health conditions of many countries. The most recent volume reports on thirty-four countries and colonies. From time to time Sir George Buchanan, who has done such yeoman service in the cause of international hygienic co-operation, has described the work in our columns. But, when all is said, it remains true that the League's medical work has seemed remote from the ordinary interests of professional life, too much a matter for officials and representatives to excite the enthusiasm of those whose work is mainly clinical. Undoubtedly when the problem is, for instance, that of quarantine regulations or the standardization of biological therapeutic substances, it is inevitable that those called upon should be able to speak with official authority or have special technical qualifications. But it should not be forgotten that already—for instance, in the study of cancer—the Organization has had the services of eminent clinicians, and that by no means all those who have worked for the League have been Government officials. It has also been said that the actual research work of the scientific committees has not always been important, and that real international comparability of mortality and morbidity rates has not been secured. These are pertinent criticisms, but a beginning has been made; those who have read the earliest volumes of our national medical statistical records will find much to criticize, and the difficulties which in a national system required the lifetime of a man of genius to surmount are still greater when the question is of an international system.

What has indubitably been acquired is the habit of co-operation between medical men and women of different nations. Anybody who has had anything to do with the organization of an international scientific gathering knows only too well how difficult it is to get any real work done. Given sufficient money and advertisement, there is no difficulty in staging an extrinsic success, in arranging brilliant social functions, in securing addresses from eminent people, and in sending everybody home again well pleased. But scientific *work* involves something more; it means a willingness to co-operate regularly, a dissipation of the theatrical atmosphere of a great "function." It is in encouraging and facilitating this quiet, serious co-operation of men and women of different nations, having in common a medical training and a desire to solve some scientific problem, that the Health Organization has carried out its best work. Much remains to be done before members of international scientific committees can wholly divest themselves of the feeling that they are national representatives rather than workers at a common task, but something has been accomplished. Progress requires a much more active interest in the general body of the profession. That international committees do so often contain many official members is by no means wholly due to the bureaucracy of Geneva or of the national Governments, but rather to the fact that the medical profession as a whole takes little interest in the Health Organization. We wonder, for instance, whether anybody has even suggested that the general practitioners of different countries might usefully exchange ideas on the problems of their daily work or dreamed that the Geneva Organization might further such an undertaking.

A hopeful experiment has been in progress for some fifteen years. If the medical profession resolves to take an interest in it, to make some sacrifices for it, that experiment will be a success, whatever the political fortune of the League of Nations. If it is left to medical officials and experts it will fail—not because officials and experts are incompetent, but because they are few and specialized.

INDUSTRIAL MEDICINE: A SPECIAL SUBJECT?

Corporate attention to the preventive aspects of medicine may be said to have received its main stimulus from the complex social upheaval known as the industrial revolution. The poverty of the village craftsmen which followed upon the growth of the factory system, the economic disorders at the end of the Napoleonic wars, and the squalor of the mushroom towns, emphasized by the cholera of the 'thirties, led to a concentration of legislative measures upon poor relief and the remedy of bad environment. But measures specifically directed at the betterment of the conditions of the workers in factories really preceded any effective general public health law. As far back as 1788 an attempt had been made to deal with the abominable treatment of the little chimneysweeps, and an Act of 1802 aimed at improving the hygienic state of textile factories, limiting the hours of labour of apprentices, and providing for their education. Largely because the execution of this and subsequent laws was relegated to justices of the peace in quarter sessions, as being the only local bodies then in existence uniformly throughout the country, they were never given serious effect. Modern factory control really dated from the Factory Act of 1833, which established factory inspectors for wide regions and gave them for a time dictatorial powers. In a broad sense their main function might have been described as industrial hygiene, since it was their object to remove conditions inimical to the health of the workers. Incidentally they were partly responsible for the establishment of a national system of education, for it was their duty to see that child workers received schooling. It was with hygienic as much as with philanthropic motives that men like Oastler, Owen, Fielden, Shaftesbury, and Sadler devoted their lives to fighting the cause of the worker.

Yet it was nearly a century before it was found worth while to introduce a medical personnel into the Government Department, the Home Office, concerned with factory administration. Since 1844, it is true, local factory surgeons had been officially appointed, but with functions then, and even now, limited mainly to certification of entrants as fit for industry, although in recent years the investigation of certain specified industrial diseases and poisonings and the regular examination of workers in some dangerous trades has been added to their duties. Nevertheless, valuable contributions to the knowledge of occupational disease and mortality were made throughout this period by medical men, notably Thackrah, Greenhow, Simon, Farr, Guy, and Arlidge. The importance of this work was recognized by the appointment of the first medical inspector in the department of the Chief Inspector of Factories in 1898. Since the great war many large firms have appointed medical officers to attend to the health of the employees, in connexion with their welfare schemes or otherwise, and this development has found favour among the workers themselves. Interest in both the physical and the psychological effects of working conditions has been quickened. Investigation has been fostered by the Industrial Health Research Board of the Medical Research Council, and knowledge spread to the workers by publications of the Home Office and through the lectures and pamphlets of the Industrial Welfare Society.

Naturally this accession of knowledge is a matter of keen interest to the trade unions, at whose recent meeting in Congress the neglect of the medical schools to convey it to their students was criticized. The suggestion appears to have been made that there should be chairs of industrial medicine in the universities. Birmingham has appointed a reader in industrial hygiene and medicine, with an appropriately equipped department, and very valuable work on these lines has been done, and continues to be done, under Dr. G. P. Crowden in the department of industrial physiology of the London School of Hygiene. From the point of view of research and post-graduate study there is much to be said for such a development, though there may be room for difference of opinion as to whether professorships of this kind should be multiplied. In so far as academic bodies determine emoluments according to the status of the members of their staffs—and the pecuniary prospects for part-time workers in this field are poor—the suggestion is commendable. A vigorous department concerned with industrial health would influence the clinical teachers and help to equip young graduates with knowledge essential to their successful practice in most areas. There are limits, however, to the special subjects in which undergraduates can be tutored within a curriculum of reasonable length, and they ought to be confined to distinct specialties in a scientific sense. Industrial medicine is not essentially different from the rest of medicine, and occupational health is an aspect of public health. The wards and out-patient departments of the hospitals where students are taught and the pathological laboratories of the medical schools afford material for clinical and pathological instruction in diseases peculiar to industries. As to prevention, the British Medical Association's Committee on Medical Education, the London Conference on the Medical Curriculum, and the Curriculum Committee of the General Medical Council, are at one in stressing both the importance of directing the attention of students to the promotion of health and the prevention of disease throughout the whole course of their studies, and also the need for specific teaching in hygiene, including occupational hygiene. If this advice is followed a special course in industrial medicine for medical students should be unnecessary, but specialists in this field might well be engaged to deal from time to time with aspects of their subject in a way which the heads of teaching departments consider suitable for the undergraduate. The utilization of such special knowledge and experience would be facilitated by the establishment and constant use of the boards of studies which the Association's committee recommends medical schools to adopt.

PINK DISEASE

This disorder of childhood deserves to be better known, and the careful account of it given by Drs. A. J. and I. Wood elsewhere in this issue (p. 527) should enable practitioners easily to recognize the malady. The name chosen by these authorities is vague, but, pending a more exact knowledge of the cause of the condition, is to be preferred to "infantile acrodynia," or "erythoedema," or "vegetative neurosis," some of the alternatives used in other lands. Swift of Adelaide is generally credited with being the first to describe pink disease, but a recent search of literature has shown that Selter of Solingen gave an excellent account of the malady in 1903, preceding by some time Swift's paper on the subject in 1914. However, it is mentioned in the present contribution that Swift had already seen cases of pink disease in London in 1885, when he was a house-physician at the Hospital for Sick Children, Great Ormond Street, so that the name Swift's disease or the Swift-Feer disease is fully justified. The theories of causation are many: some form of infection, a deficiency disorder, or the effect of sunlight are the more popular. The present paper issues a wise warning against too much attention being paid to changes in the nervous system found in a child who has already died of starvation and exhaustion, and the pathology of pink disease may well be overshadowed by the pathology of its complications. The clinical picture of a fully developed case of pink disease is unmistakable: the intense misery, photophobia, insomnia, anorexia, sour sweating, stomatitis, hypotonia, tachycardia, and the curiously red, puffy hands and feet, together with the pink nose, cannot easily be mistaken for anything else once the syndrome has been previously encountered. The question naturally arises that if Swift saw such cases in London in 1885 what has been happening to clinical observers in the interval? There has certainly been a great revival of interest and diagnosis in the post-war years, helped, no doubt, by Swift's paper of 1914, but either cases were not occurring during the early years of this century or they were being labelled as something else. The three stages of the clinical manifestations described by the Woods are a useful way of analysing the symptoms, but even the first stage, with its intense mental misery and great irritation of the skin, is so striking that abortive cases can scarcely have passed unnoticed. The possibility of an increased incidence in the post-war years lends colour to the theory of pathogenesis most favoured by the Woods—namely, that a virus is to blame—and pink disease would thus fall into the group of virus diseases of the nervous system which has so greatly expanded since epidemic lethargic encephalitis first appeared. Clearly the treatment of pink disease must remain symptomatic until the exact cause of the malady is found. The symptoms show a natural tendency to improve during the third month, and this fact has to be borne in mind when any special therapeutic agent is put forward as a specific remedy. Regulation of clothing, open-air treatment, careful toilet of the skin and mouth, a generous diet rich in vitamins, and sedative drugs are the main lines upon which treatment should be planned. According to the Woods the prognosis is excellent save for the risks of intercurrent infection.

MALARIA AND ITS TREATMENT

The pressing need for an institute in this country in which research on the chemistry of drugs for treating malaria and other diseases could be carried out was referred to at the meeting of the Chemistry Section of the British Association on Monday, September 9th. Colonel S. P. James, who opened the discussion, gave some interesting figures of the amount and cost of antimalarial drugs actually used, and of the morbidity of the disease. The Government had had to foot a bill of £350,000 for treatment and preventive measures in the Ceylon malaria outbreak, 14½ tons of quinine costing them £50,000 and £20,000 being paid for the German drug atebrin. Even the small island of Mauritius had spent the sum of 3,500,000 rupees since 1909 in fighting malaria, and Lagos had spent more. During the great war 70,000 British soldiers were ultimately put out of action in the Salonika campaign, while both the French and the Germans suffered equally badly. It was estimated that at the present time three and a half million persons die of malaria every year, most of the deaths occurring in parts of the British Empire. Though we disbursed nearly £500,000 on the purchase of quinine, yet our expenditure for research into the solution of the malaria problem amounted to barely a two-hundredth part of this sum. It was necessary to discover new drugs to supplement quinine treatment and to improve on it. The two important new antimalarial drugs—plasmoquine and atebrin—discovered by German chemists during the last eleven years were, added Colonel James, in some ways superior to quinine, but for benign tertiary malaria the latter was more effective. In spite of the humanitarian, economic, and imperial importance of antimalarial drugs there was, in this country, backwardness in research into their chemistry. In an account of investigations which had taken place under his direction, Professor R. Robinson stated that although twenty-four synthetic drugs had been discovered, none of them had the required effectiveness, and research had now reached a stage where further advance was impossible without adequate funds and more laboratories. Chemists needed a certain psychological stimulus, while chemical and biological co-operation could be made satisfactorily only when conducted under one roof; that was why a national institute for research in chemical therapy should now be founded. One contributor to the discussion was Professor Schulemann of Elberfeld, who attributed German successes in the production of plasmoquine and atebrin to the invention of new methods of testing the properties of synthetic substances by biologists. Plasmoquine was the thirty-fifth substance in a certain series, and since 1924 only one other effective substance had been found. The mode of operation of the two synthetic drugs was obscure, but some interesting facts were illustrated by experiments on mice. It was found that a joint application of the two drugs might produce abdominal pains, whereas if one were given immediately after the other there was no such effect. Mice could be killed if given the drugs on an empty stomach, but after a meal this did not occur. Yet if some of the gastric juice from these mice was injected into others which had had nothing to eat they would die. This showed how drugs might be absorbed on the surface of food particles.

ACCOMMODATION FOR THE MENTALLY DISORDERED

The Board of Control in its annual report, an account of Part I of which is printed at page 547, points out that the increase in the number of patients notified as suffering from mental disorders represents merely the difference between the total admissions to hospitals and institutions receiving such patients and the total deaths and discharges. This increase, therefore, affords no measure of the actual incidence of mental disorder among the general population. Even the admission rate to these institutions per general population falls far short of a conclusive test by reason of the influence of certain extraneous factors. Two of these are mentioned by the Board as important. One is a fall in the death rate among the patients under care in 1934 to a point so low that it constitutes a record for mental institutions in this country; the other is a notable rise in the number of patients admitted to public mental hospitals on a voluntary footing. Both are matters for congratulation, especially the latter, in so far as it affords evidence of a readier recourse to special hospital treatment at a favourable stage of the illness. There are, however, other extraneous influences at work which largely escape mensuration yet greatly obscure the position: for example, the attitude of the public to mental hospitals, or, otherwise expressed, the degree to which the public mind has been enlightened (and disabused of ancient prejudices) by various means as to the great work of healing and amelioration carried out by these hospitals. The Board points out that the provision, or lack, of proper accommodation has important bearings on the admission rate, and thus either may reveal or conceal considerable numbers, whilst there can be little doubt that widespread financial stringency in any area may easily disclose numerous mild cases of mental infirmity which otherwise would have remained officially unknown. Taking the above considerations into account, it is clear that, although it may be impossible to know whether mental disorder is in fact tending to increase or decrease, the gradual numerical increase in those officially known to the authorities affords no justification whatever for the alarmist statements which, the Board says, find their way from time to time into the Press. Nevertheless, this increase, whatever the cause, offers serious problems from the economic point of view. As summarized in another column, the report shows that the number of patients under care is largely in excess of authorized bed-space, and that the additional accommodation already being built or in plan will, when completed in the next four or five years, still be inadequate even for the existing excess. The pressure for accommodation seems likely to become greater for some time, for over and above what may be termed the normal rate of increase, consequent on the increase of the general population, the full effect of the Mental Treatment Act is still to be felt. Last year 17.4 per cent. of the direct admissions to public mental hospitals were voluntary patients—a great increase on the year preceding—and there seems to be no obvious reason why the percentage of voluntary patients admitted to public mental hospitals should not ultimately reach a figure approximating to the percentage of hospitals for private patients—namely, 60 per cent. or more. If, as the Board's comment on this matter implies, the notable increase of voluntary admissions to public hospitals is not a mere change of label, but represents a real increase in the number seeking hospital treatment—it is to be hoped in an early and uncertifiable stage of their illness—it is evident that for some years at least the demands for accommodation will become much more serious. In this relation attention may be usefully directed once more to the boarding-out of patients from mental hospitals to the care of selected guardians in private dwellings as a valuable and proved means of saving capital expenditure, and at the same time as giving the patients the greatly appreciated benefits of domestic life, comfort, and occupation. This system was warmly advocated by the Board in its annual report for 1933, but, no doubt to the regret of some, no mention is made of this in the present report, nor of the interesting application of this form of care and treatment introduced a year or two ago at one mental hospital in this country.

INTERNATIONAL LEGISLATION AGAINST PROSTITUTION

In spite of its major preoccupation (writes our Geneva correspondent) the Assembly of the League of Nations is giving its usual attention to social and humanitarian enterprises. A discussion in which representatives of ten countries participated has already taken place on the traffic in women and children. There is, on this subject, a body of international legislation which is nearing completion. Three conventions—those of 1921, 1923, and 1933—have been concluded during the history of the League, and have been ratified by very many States. One necessary supplement to this legislation, to which the League is now addressing itself, is a convention to suppress the activities of *souteneurs*, or those who live on the immoral earnings of women. When a convention on this subject has been concluded the legislation will be fairly complete, and it will only remain to secure the fullest possible adhesion to these instruments. The view of the committee of the League which has been occupied with this subject is that the traffic can be more effectively dealt with when licensed houses are all abolished. The chain of licensed houses which existed up to some time ago over a large part of the world was one of the chief incentives of the traffic. But here it was discouraging to be informed by the delegate of Uruguay that his country, after having abolished licensed prostitution, had had to revert to the system "in the interests of public health." He added that after licensed prostitution was abolished the incidence of venereal disease increased by 40 per cent. In readopting a system of licences his country had arranged for instruction in prophylactic measures. The delegate of Chili spoke to the same effect: after an unfortunate experiment Chili had returned to the system she had wished to abolish. On the other hand, the experience of Denmark, as related by Mlle Forchammer, vice-president of the International Council of Women, was that with the closing of licensed houses venereal disease had decreased. She said that no responsible person in Denmark, either in the police service or in the medical profession, would wish to revert to the old system. The Spanish delegate said that his Government had before Parliament a Bill

making for the first time venereal infection a punishable offence. In June last, also, a decree was issued prohibiting licensed prostitution in Spain. The feeling was expressed in the debate that abolition, pure and simple, is not sufficient, and that provision must be made for the rehabilitation of ex-prostitutes. An inquiry by the League is now proceeding into the rehabilitation measures adopted by various countries and the national services for dealing with venereal disease. In this connexion Madame Starhemberg, the representative of Austria, mentioned the great organization known as "Caritas Socialis" at Klosterneuburg, near Vienna, founded by the late Chancellor of Austria, Monsignor Seipel. This is directed by lay sisters, and has attained much success both in the cure of venereal disease and in the education, cultural growth, and moral restitution of prostitutes. It has been decided to hold, at the beginning of 1937, a conference of Governments and authorities responsible in Eastern countries for the measures taken to suppress the traffic in women and children. The Governments of the United Kingdom, France, the Netherlands, Portugal, the United States, China, and, provisionally, Japan have agreed to participate. The conference will have to take place in the East itself. Miss Horsburgh, M.P., who is one of the British delegates, said that the last licensed house in Hong-Kong was closed in June, and in Singapore licensed houses had been abolished.

CRIMINAL STATISTICS

Statistics of crime for England and Wales in 1933 have been published in a Blue Book, and a comparison is made of the five-year period 1929–33 with earlier years. In this period the proportions of persons over 16 charged with indictable offences were much lower than in the pre-war years, but those of persons under 16 were higher. It is suggested that one factor in this contrast is the greater readiness nowadays to charge children and young persons, since punitive measures have been so largely replaced by attempts at reform. Persons found guilty of non-indictable offences in 1933 numbered 540,955, among whom were 284,528 guilty of road traffic offences, 30,630 chargeable under the Revenue laws (mostly for failure to take out licences for motor cars or dogs), and 30,073 chargeable on account of Sunday trading. There has been a continuous decline in cases of cruelty to children, but slight increases in cases of begging and drunkenness. The number of persons found guilty of indictable offences in 1933 was 62,660, as compared with 64,958 in the previous year; children under 16 found guilty of indictable offences numbered 13,364, the charge being theft in 96 per cent. of the cases. In 43 per cent. of these offences the age of the person was under 21; in 20 per cent. the age was between 16 and 21; and in 23 per cent. it was under 16. The proportion of offenders was nearly eight times higher among males than among females, and three or four times higher among boys and youths under 21 than among men aged 30 and over, but the age groups over 21 contain most of those who are responsible for the more serious offences. In a comparison of the five years since 1929 there was no substantial change in the numbers guilty of acts of violence against the person, and sexual offences slightly declined, but there was an annual increase in the numbers of thefts and frauds until 1932, when a small decrease was noted. Children were the offenders in a large proportion of the breaking and entering cases, unoccupied property being usually concerned. Many of the larceny cases were minor thefts of small articles such as bicycle pumps or lamps and pilfering from automatic machines; only 6 per cent. of the persons found guilty in 1933 were sent to prison for more than three months, 78 per cent. being dealt with by fines or action under the Probation of Offenders Act. While the statistics show a large increase in the number of child offenders under the age of 16, it is pointed out that this fact may be related to the fall in the birth rate in the war years and to the subsequent rise in that rate from 1920. It is also suggested that industrial depression and unemployment have a bearing on all the rates in the years 1929 to 1932, the better figures in 1933 being associated with the fall in the unemployed totals for the last year in the case of adolescents and adults. Probably, also, delinquency among children is affected by unemployment; when home conditions are harder and there is less pocket money available there may be an increased tendency to pilfer, but the improvement shown in 1933 as regards male offenders of all ages over 16 did not extend to boys under 16. In the year under review there were known to the police ninety-nine cases of murder of 110 persons aged 1 year or over. In forty cases involving forty-three victims the murderer, or suspect, committed suicide; in fifty-eight cases, involving sixty-six victims, one of whom died following an illegal operation, fifty-eight persons were arrested. Of the nineteen persons convicted of murder, eleven were executed and eight sent to penal servitude for life. The number of suicide verdicts in 1933 was 5,543, as compared with 5,657 in 1932, and 5,092 in 1931.

THE MELBOURNE MEETING

The Annual Meeting reached its official conclusion at the end of last week, and most of the British delegates are said to be leaving for the East Indies and the Malay Peninsula, joining a P. & O. liner for England via Suez. The Section proceedings have, on the whole, attracted a considerable amount of attention in the lay press in this country, and the importance of the Melbourne Meeting has been stressed in more than one leading article. The Federal Government announces that as the first step towards a permanent memorial of the meeting there is to be established immediately a Federal Medical Research Council with the co-operation of the States, and it is expected that this proposal will attract many endowments. During the course of the meeting the following members received honorary degrees from the University of Melbourne: Lord Horder, Sir Henry Gauvain, Dr. J. S. Fairbairn, Sir William Willcox, Dr. Edwin Bramwell, Dr. E. Kaye Le Fleming, Sir Ewen Maclean, Dr. Robert Hutchison, Sir Lindo Ferguson, and Dr. E. Wilfred Fish. The Royal Australian College of Surgery conferred honorary Fellowships on Mr. H. S. Souttar and Professor Hey Groves. As the President of the College, Dr. J. S. Fairbairn, was present, seventeen Australian and New Zealand doctors were admitted to the membership of the British College of Obstetricians and Gynaecologists. It is stated that 800 guests attended the Annual Dinner.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

THE POST-ENCEPHALITIC PARKINSONIAN

BY

SIR ARTHUR J. HALL, M.D., D.Sc., F.R.C.P.

Before discussing the details of such lines of treatment as are known to afford relief it is well to be clear as to exactly what it is that calls for treatment. The unknown poison that causes chronic encephalitis may involve almost any part of the central nervous system, with an especial predilection for the intracranial rather than the spinal portion. Moreover, the extent to which different parts of the higher centres may be affected varies widely in different cases. In some, somatic disability (the Parkinsonian syndrome) predominates, while psychical (mental or moral) changes are slight or perhaps absent. In others it is the reverse. Sometimes both mind and body are seriously affected. A second point of importance concerns not only the particular form but also the distribution of the Parkinsonian syndrome. Muscular rigidity with slowness of movement may be present without tremor, or both may be present together, or tremor may predominate from the first ; and any of such combinations may be unilateral, or bilateral, or almost universal in distribution. Sometimes the legs are affected early and severely ; in others they are hardly affected at all. Thirdly, whether treated or untreated, some patients go rapidly from bad to worse, while in others the disability remains slight and almost stationary for years together.

In this article the treatment of the mental and moral changes will not be dealt with in detail. Speaking generally, they most often call for that kind of organized care and occupation which in many instances can only be satisfactorily obtained at special institutions adapted for the purpose. Such do exist and serve a useful purpose, and there might well be more with special provision for this type of case.

Increased Muscular Tone

It is in relief of the common symptom of increased muscular tone that treatment has so far been most successful. The slowness or poverty of movement to which the disease gives rise can in most cases, and to a certain extent, be made less by the action of one particular group of alkaloids—the atropine series.

The three members of the group which are most commonly used are atropine, hyoscine, and stramonium (arranged in alphabetical order). Each of these has its advantages and its drawbacks. Each, if prescribed in sufficiently large doses, is capable in certain cases of producing immediate effects as dramatic in character as any seen in medicine. Moreover, these effects can be maintained for long periods provided the treatment is continued. Each has its advocates, and it is quite natural that, having succeeded with one of the three, a practitioner gets to know how best to employ this particular drug and hesitates to make use of the other two. As a matter of fact, there are patients in whom some one of the three seems to act more effectively than either of the other two. Why this should be so is as yet unexplained ; indeed, the pharmacological action of the atropine series in relieving the muscular rigidity of the Parkinsonian has not yet been worked out. Nor will such working out be an easy matter. The Parkinsonian has as a rule an abnormal mentality, and the available means of measuring accurately any change in his condition as the result of treatment cannot be carried out without his full knowledge and co-operation. A slight modification in the method of administering the same dose of the same drug may produce a psychical reaction which quite masks its effect.

During recent years a method of treatment by atropine, which was originally advocated by Kleemann[1] in Germany, has been widely adopted in various countries ; the following is a short account of the method.

Kleemann Method of High Dosage of Atropine

The idea of this form of treatment was obtained from Bremer's observations on the unusual tolerance of Parkinsonians for atropine (*Arch. f. klin. Med.*, 1925, cxlix, 340). This treatment was carried out by Kleemann[1] on thirty-seven cases at an institute, and was supplemented by baths, massage, exercises, etc. The method consists in ascertaining the *maximal dose of atropine* that causes improvement. This is found by a daily graduated increase of dose. When such increase yields no further benefit the dose is similarly decreased day by day until the return of the symptoms shows that the dose is too small. A dose slightly higher than this is then chosen as the *optimal dose* for that patient, and it is continued at that amount daily.

The patient should be in bed during the estimation of the optimal dose. A solution of atropine sulphate in distilled water (1/4 or 1/2 per cent.) is used. The necessary dose can be measured by a pipette or syringe, and, suitably dilated, is given by mouth.

First Day.—Begin with the total daily amount of 1/2 mg. (0.5 mg.) of atropine, given by mouth in two equal doses—that is, 1/4 mg. morning and evening.

Second Day.—Increase by 1/2 mg. atropine, spreading it over three doses—1/4 mg. morning, 1/2 mg. afternoon, and 1/4 mg. evening.

Third Day.—Increase by 1/2 mg.—1/2 mg. morning, 1/2 mg. afternoon, 1/2 mg. evening. Continue at the same rate of daily increase so long as any objective or subjective improvement is produced.*

Maximal Dose.—When a dose is reached at which no further improvement ensues, keep on at this maximal dose for a few days, then reduce the dose by 0.25 mg. until a point is reached at which objective or subjective symptoms return. A slightly higher dose than this is considered to be the optimal dose, and is then given daily in the form of pills made to this strength for this patient. The patient is then allowed to go about and take one of these regularly three times a day.

While estimating the optimal dose it was found that, although the omission of a single dose for any cause was not of importance, when the doses were reached a break in the treatment of any length—as, for instance, if vomiting occurred—gave rise to unpleasant symptoms. In such circumstances a dose of two-thirds the amount taken by mouth was injected subcutaneously until vomiting ceased. In mild cases the optimal dose is usually

* Professor Wayne informs me that in his experience of treating cases by high atropine dosage at the Sheffield Royal Infirmary the dose may be increased much more rapidly.

from 3 to 7 mg. of atropine daily. In severe cases it varied from about 12 mg. to 24 mg. of atropine daily (in one case). The maximal dose in any of the cases was 26 mg. of atropine in a day.

Toxic Effects.—The temporary paralysis of accommodation can be met, if necessary, by suitable glasses. Excessive dryness of the mouth is not a contraindication, and tends to disappear with increasing doses. If vertigo, flushings, palpitation, and stomach symptoms are complained of, continue with the same dose for a few days. The symptoms usually cease and the daily increase can be renewed.

During recent months I have had the opportunity of seeing a certain number of patients treated by this method. Whilst a full account of these will be forthcoming when the series of cases is completed, it may be said now that in many cases, even the most severe, quite marked improvement does take place. Speech, which for some time has been almost an inaudible whisper, becomes easily heard. General movements of the body and limbs become more free, and in some instances patients who had been almost totally dependent become almost independent. In the cases with troublesome sialorrhoea the relief secured is usually considerable. The frequent oculogyric attacks in some patients have been reduced in number and duration. The subjective sense of well-being brought about by the treatment itself reacts on the mentality of the patient, thereby leading to further effort. In some cases there has also been improvement in the tremor. On the other hand these favourable results are not constantly attained. The reasons for this are somewhat obscure, and probably vary in different cases.

While Kleemann's method of administering atropine may be carried out in all cases, it seems hardly necessary for many milder ambulant patients: a much smaller dose of atropine, prescribed as tincture of belladonna, is sufficient to keep them comfortable for years. The term "smaller dose" is only relative. Judged by the *Pharmacopoeia's* standard the doses are high. Thus many of my patients take three drachms a day, or even more.

Hyoscine (Scopolamine) and Stramonium

Hyoscine was formerly supposed to be another isomer of atropine, but actually it is slightly different chemically and has a pronounced depressant effect on the higher centres. It may be administered hypodermically or by mouth. The latter is obviously more convenient in patients who are going about. Larger doses (1/50 grain or more) than those stated in the *Pharmacopoeia* can be tolerated.

Stramonium, like the other two members of the group, has a powerful action in relaxing the increased muscle tone, with great relief to the Parkinsonian. It may be prescribed either in the form of the tincture in doses from 10 minims up to a drachm or more three times daily. Hurst (*Lancet*, 1934, i, 499) finds the addition of pilocarpine nitrate (1/10 grain or more) useful if dryness of the mouth is troublesome. In some cases of Parkinsonism the checking of salivation is an advantage. Another form of administration is as a pill containing the dried extract. Here again the dose necessary to be effective in most cases is considerably higher (1 to 2 grains or more) than the maximal dose of the *Pharmacopoeia*, and it can be continued for an indefinite period.

In making use of any of these three drugs in the treatment of Parkinsonism the general principles laid down for the Kleemann method may well be adopted at the first—namely, to ascertain the optimal dose for the individual by careful experiment rather than to begin with large doses, which is not without risk of unpleasant effects.

Tremor

When post-encephalitic Parkinsonism first appeared tremor was not a predominant or even a common feature. Sooner or later, however, it is observed in most cases, and when marked is the symptom for which relief is most urgently sought. Unfortunately such relief is very difficult to give. As mentioned above, improvement has in some cases followed high atropine dosage. Surgical measures in the form of removal of the lower cervical sympathetic ganglion have been advocated in cases in which the tremor is limited to, or particularly troublesome in, one arm. In one patient in whom this procedure was adopted the tremor of the arm continued as before.

General Treatment

While much relief may be and is obtained by one or other of these drugs, all those familiar with large numbers of these patients realize the importance of environment. The greatest asset that a Parkinsonian can have is a good home with a sensible and sympathetic parent or spouse to guide and help him. Next to that the life of a well-ordered suitable institution is probably the best. In the milder cases constant daily encouragement and help should be given towards the carrying on of life and the keeping up of interests in every way possible. In well-organized institutions baths, massage, games, and light occupations play an important part from the psychotherapeutic point of view. In private life also definitely regulated amusements, exercise, and occupations are of service.

From time to time zealous enthusiasts, carried away by the real but temporary improvement so characteristic of this chronic disease, deceive themselves and raise false hopes in others that an infallible cure has been found in some particular line of treatment. Such hopes are at present without foundation. There are a few cases of post-encephalitic Parkinsonism which show no signs of getting worse as the years go by, and a still smaller number in whom such few early symptoms as there were have become less marked, but there is no evidence that any form of treatment as yet known can remove it altogether or even check its natural rate of progress.

REFERENCE

[1] Kleemann, Anna: *Deut. Zeit. f. Nervenheilk.*, 1929, cxi, 299.

A. L. Hurez (*Thèse de Paris*, 1935, No. 551) records his observations on 244 cases of enteric fever in children which occurred in Lesné's service at the Hôpital Trousseau, Paris, from 1920 to 1934. Typhoid fever accounted for 162, sixty-two were due to paratyphoid B, and two to paratyphoid A, while in eighteen the variety of enteric was not determined. In 242 cases the ages were as follows: under 2 years of age two, between 2 and 5 years twenty-seven, between 5 and 10 seventy, and between 10 and 15, 143 cases. In 40 per cent. of the cases the onset was sudden, simulating influenza, pneumonia, tonsillitis, acute peritonitis, appendicitis, or acute meningitis. High temperature was the most constant symptom, and was almost always well borne. A typhoid state was inconstant and often slight. Dissociation of the pulse and temperature was not the rule, and dicrotism was very rare, except among the older children. The intestinal symptoms were almost always attenuated, meteorism was usually very slight or absent, and constipation and normal stools were as frequent as diarrhoea. Rose spots were seldom absent, and were frequently profuse. Enlargement of the spleen was the most constant sign. Pulmonary manifestations were almost always present. Nervous signs were rare and not pronounced. Albuminuria was exceptional. Loss of flesh was frequent from the onset of the disease. Enteric fever in the child is often of short duration, but relapses are frequent. Severe complications were rare. The mortality was 9.4 per cent.

Scotland

Sanitary Congress at Dunoon

The sixty-first annual Congress of the Royal Sanitary Association of Scotland met at Dunoon on September 11th, 12th, 13th, and 14th.

PUBLIC MEDICAL SERVICES: FUTURE DEVELOPMENT

On the first day Dr. G. V. T. M'Michael, medical officer of health for Paisley, delivered a presidential address on the future development of public medical services. The present organization of public medical services, he said, was incomplete and inadequate as compared with such as the education service. The appointment of the Committee on Scottish Health Services in 1933 had been an acknowledgement that public medical services needed review before further development took place. He thought the time had now come for official recognition of the fact that the planning, maintenance, and development of a national health policy was one of the functions of the State. The basic provisions for a national health policy could be included under two main heads: (1) a complete environmental health service; and (2) a complete national medical service. The defects of the present medical services—including national health insurance, public assistance medical service, maternity and child welfare, and the school medical service—were in the main that: (1) they made no provision for large numbers of the population who were not in a position to provide for themselves; (2) they had serious limitations and in no case provided an adequate and complete service; and (3) they were administered locally by different authorities, with resultant division of responsibility and absence of useful co-operation. Dr. M'Michael believed it was essential that local administration should be entrusted to a single authority, and that all the provisions of a medical service should be available for every member of the community. A national medical service should include a general practitioner service, specialists and consultants in various branches (including midwifery), and a general scheme of home nursing with ample hospital accommodation. The general practitioner service could best be developed on the lines of the present national health insurance service, and an important duty of the general practitioner in the future would be the conservation of health rather than the treatment of disease. With regard to the hospital services few of them would wish to see the disappearance of the magnificent organization that had been built up by the voluntary hospitals, but if an efficient hospital service was to be maintained and overlapping avoided there must be in the future more definite co-operation between the voluntary hospitals and the local health authorities than had been shown in the past. A paper was afterwards read by Dr. John Ritchie, medical officer of health, Dumfries, in which he said that the distinction between preventive and curative medicine was disappearing, and health authorities of the future would require to have at their disposal all the resources of medical science. Few of the health authorities existing in Scotland possessed the necessary resources for this, and some measure of unification seemed inevitable. It was in reference to solving these difficult problems of unification that the health authority of the future would eventually take shape. Dr. C. W. Sleigh of Aberdeen gave an account of the regional medical scheme for Aberdeen city and the counties of Aberdeen and Kincardine, and said that the scheme helped to solve many difficulties. It would be impossible for most rural areas to provide institutional treatment such as could be given in a large city, and regional areas ought to be formed round the medical schools of Scotland at Edinburgh, Glasgow, Aberdeen, and Dundee.

HOUSING PROGRESS

On the second day of the congress an address concerned chiefly with the housing of the people was delivered by Mr. A. N. Skelton, Parliamentary Under-Secretary of State for Scotland. He said that the Housing Act of 1935 dealt directly, for the first time, with the whole problem of overcrowding. Since 1919, 193,270 State-aided houses had been built, and it might be estimated that about 750,000 people, or nearly one-sixth of the population of Scotland, had thus been rehoused. There were under construction at present a further 23,000 houses, which would rehouse another 93,000 people. The work of lessening the overcrowded population would still require the erection of a large number of new houses. There had been certain defects in this work, the greatest being that new houses had been set down without sufficient provision for open spaces and other amenities of life. It was essential that in new housing schemes sufficient land should be reserved from the outset for improvements and additions to the facilities associated with housing development. This aspect of the matter had a great effect upon the health and spirits of the inhabitants. There had also been the difficulty of adjusting rents to the economic circumstances of individual tenants, but under the new Act provisions had been made to deal with this matter, and to see that houses would in future be occupied by the persons who most needed them. Dr. Clark of Edinburgh, secretary of the Society of Medical Officers of Health, said that the new Act was a very definite advance, but until the captains of industry and chambers of commerce assisted in the work there would not be adequate town planning.

DIRECTION OF HEALTH EDUCATION

The third day of the congress was devoted to discussing the directions in which progress could be made in the creation of a healthy population. Dr. Alister Mackenzie, medical officer to the Glasgow Committee for the Training of Teachers, speaking on health education, said that a beginning must be made with the child to create the kind of citizen who would be worthy of all the work that had been done in public health. Health education might be defined as an attempt to develop in each individual habits, attitudes, knowledge, and ideals which would promote his physical, mental, and emotional well-being in the community. Up till now public health services had dealt with man in the mass; to-day attention was focused on man as an individual. The State could build the man a house, but it could not make for him a home. By proper habits and attitudes the individual could do much to make or mar his own health and that of others, and health progress now depended on the willingness of the individual. The teacher had an important part to play, demanding a background of knowledge greatly exceeding the facts that he would teach. He must live healthily and have a sympathetic understanding of the social setting of the child. Children must be trained from the earliest age in correct health procedure, although it was not necessary to know a great deal about the inner structure and workings of the body in order to be healthy. Dr. J. Jardine, assistant secretary of the Scottish Education Department, said there were many hopeful features to-day, among them the development of hiking and of school camps. He believed that every child over 12 years should have some knowledge of the working of the body, and with regard to domestic science an effort should be made to establish continuation classes for girls prior to marriage.

Larbert Industrial Colony

The new scheme of the Royal Scottish National Institution for Mentally Defective Children at Larbert, which consists of an industrial colony costing £130,000, was opened on September 12th by the Countess of Mar and Kellie. The colony is situated to the west of the Edinburgh–Stirling road in a wide area of fields and woods, and includes five large villas for inmates, an administrative block and nurses' home, a recreation hall and workshops, and is intended, with a farm, gardens, and poultry farm, to be practically self-supporting. It has recently been increasingly recognized that in many cases mental deficiency is permanent, and the directors of the Larbert Institution therefore decided to provide for the all-life care of many patients who had been in the institution as children. An estate of 750 acres was purchased near the institution, where the large mansion house will be used for private patients paying the full cost of their maintenance. The five new villas will each provide for fifty patients, and a hospital and two more blocks for helpless patients are under construction.

CORRESPONDENCE

Territorial Army Annual Training

SIR,—The brigade of the Royal Artillery (T.A.) to which I am attached as medical officer went to camp for its annual training on July 28th and returned on August 14th. It occurred to me that this would offer an excellent opportunity of studying the effect of the change from civilian life and diet to those of the soldier. I record the results of my investigation below.

The men are drawn from three districts: the first and second batteries come from Stoke-on-Trent, an industrial city with a population (including the adjoining town of Newcastle) of 300,000; the third battery comes from Leek, a moorland town with a population of less than 20,000, and the fourth from Stafford, which has a population of about 30,000. During the camp the following five articles of diet were issued to the batteries for the men per head each day:

Bread, 1 lb.; meat (frozen), 3/4 lb.; tea, 3/8 oz.; sugar, 1½ oz.; salt, 1/4 oz.

The cash value of these is reckoned at 4.11d., and as 9.44d. is allowed daily for feeding, the remaining 5.33d. was available for expenditure on bacon, milk, vegetables, eggs, etc. There is also an additional allowance of 5½d. —a T.A. grant—so that nearly 1s. 3d. is spent on feeding daily. There is the advantage of mass buying! Thus, as compared with the two standards of feeding recently discussed by the medical profession and the general public (the 3,400 and 3,000 calories diets), the diet is distinctly generous. A specimen diet sheet for five days was as follows:

Breakfast

Day 1. Bread, margarine, tea, bacon, sausage.
„ 2. Bread, margarine, tea, bacon, tomatoes.
„ 3. Bread, tea, liver, bacon, brown gravy.
„ 4. Bread, tea, margarine, bacon, tomatoes.
„ 5. Bread, tea, bacon, fried onions.

Dinner

Day 1. Pontoon, potatoes, bread, currant pudding.
„ 2. Roast beef, potatoes, beans, boiled rice, jam.
„ 3. Boiled meat, potatoes, butter beans, suet pudding, jam.
„ 4. Roast beef, potatoes, peas, mixed fruit pudding.
„ 5. Pontoon, potatoes, carrots, fruit pudding.

Tea

Day 1. Tea, bread, margarine, salmon, vinegar.
„ 2. Tea, bread, margarine, jam, cake.
„ 3. Tea, bread, margarine, cheese, onions, sauce, cake.
„ 4. Tea, bread, margarine, liver sausage, sauce, jam.
„ 5. Tea, bread, margarine, jam, cake.

Supper.—Soup every evening.

The messing was by batteries. Comparatively few men turned up for the evening soup.

The brigade is mechanized, and the work done by the men is "light manual." The site of the camp was Trawsfynydd in Merionethshire, a mountainous district. The weather was perfect, and all ranks were very happy. In the first two batteries I examined 103 men on the second and thirteenth days of camp at the same time of day and similarly dressed on both occasions. The total gain in weight was 199 lb. net—that is, an average gain per man of 1.93 lb. The greatest individual gain was 8 lb. and the greatest loss 5 lb. The average gain in the case of the men (thirteen) unemployed in civilian life was slightly greater (2.16 lb.). In the third battery forty-six men gained 83½ lb.—that is, an average gain of 1.82 lb. per man. In the fourth battery sixty-one men gained 204 lb.—that is, 3.34 lb. per man. In this last battery the greatest gain was 8 lb. (two men) and the greatest loss 3 lb. In the brigade as a whole 210 men gained 486½ lb.—that is, 2.22 lb. per man.

Presumably the figure that would be given for the full period of fourteen days would be larger than this, but a longer interval than eleven days was found impossible on this occasion. The men certainly had greater appetites than at home (their own statements), many eating hearty breakfasts who scarcely touched this meal at home. The colour of the men's complexions improved tremendously, just as those of ordinary holiday makers in good weather. This was particularly noticeable when a new draft joined the unit midway through camp. In conclusion, there would appear to be no doubt that the annual fortnight's training in the T.A., under good conditions, does the men a very great deal of physical good.

I wish to record my thanks to Colonel G. Howson, commanding 61st Brigade, R.A., for permission to carry out this investigation.—I am, etc.,

C. W. HEALEY, *M.C.*, M.D.
Major R.A.M.C.(T.A.).

Stoke-on-Trent, Sept. 8th.

Views on the Cancer Problem

SIR,—Dr. H. E. Annett, in his contribution in the *Journal* of September 7th (p. 479), refers to the well-established fact that cells which perform a special function have lost their power of division. Cancer, therefore, cannot originate in tissues composed of such cells. I would like to suggest, however, that it is necessary in considering the origin of cancer to consider not only the special but also the general or primary functions of the cell, functions which are common to all cells except the most highly differentiated. Particularly is this important with regard to the part played by hormone-like substances in cancer.

The primary functions of any cell are: (1) the metabolic function, whereby food substances are absorbed and elaborated in the cell and waste products eliminated; (2) the function of mitosis; and, closely associated or perhaps identical with this, (3) the regenerative function, whereby damage from disease or injury is made good. A less obvious function, but one which, I suggest, must logically be admitted, may be described as (4) the co-ordinating function—that is to say, the function by which the growth-regulating hormone is received by the cell. In studying hormonic action in general it is not enough to consider the gland or other source of the hormone, nor the nature and action of the hormone itself; it is also necessary to take into account the "receiving end" of the apparatus, the capacity of the cells of the tissue controlled by that hormone to receive and correctly react to or interpret the hormone.

Now if in any group of cells, large or small, a condition should arise in which all functions are imperfectly performed, the result of such defective functioning could be foretold with some accuracy. If we could imagine a physiologist who had no knowledge of cancer, and were to ask him the logically inevitable result of defective functioning of such a group of cells, he would, I suggest, describe a series of changes which would in fact be descriptive of cancer. The defect in the metabolic function would result in the excretion of partially metabolized substances, which would be foreign, and therefore toxic, to the organism; the condition would therefore be a disease, a disease necessarily progressive (malignant). The defect in the co-ordinating function would result in incoordinate or unrestrained growth of cells which were morphologically and functionally imperfect. In their growth they would follow the path of least resistance (as cancer invariably does), and would spread along the only spaces available—namely, the lymphatics in epithelial tissues, and lymphatics and small blood vessels in connective tissues.

The question of how this defect in function arises remains to be considered. I suggest that it is the result

of a combination of two factors: (1) an inherent or acquired defect in the regenerative capacity of the cells; and (2) a continuation of the demand for regenerative effort beyond the normal capacity of the cell. For we have no logical reason to assume that regenerative capacity is unlimited and incapable of being exhausted. We know that it varies in different tissues according to the liability to injury and ordinary wear and tear. But we have no reason to believe that it is the same in all individuals, or equal to unlimited demands upon it.—I am, etc.,

Leicester, Sept. 9th. T. C. CLARE.

SIR,—It might be inferred from a remark in Dr. Annett's letter in the *Journal* (September 7th) that he was a member of the staff of the Liverpool Medical Research Organization only for a short period because he did not actually subscribe to my working hypothesis. This was not so. All my colleagues were encouraged to make use of the opportunities for criticism afforded by the discussions which took place during the staff meetings held periodically. At that time Dr. Annett was, I remember, a believer in Beard's theory, which, at a later date, Dr. J. A. Murray, evidently under the impression that the two conceptions were identical, accused me of appropriating. This misunderstanding was easily removed (*Lancet*, 1925, ii, 1142 and 1196). Dr. Annett did, however, recognize the lethal effects of lead on the chorion-epithelium and on cancer cells. Now, ten years later, for the first time so far as I know, he has given reasons for his disbelief in my hypothesis, and I realize at once that he, after the manner of Dr. Murray, has misunderstood my views or has been blind to certain basal facts in relation to them. It is therefore plain that I might with justice have stated in my last letter (August 17th) not only that the literature should be studied, but also that it should be read with understanding.

Shortly stated, Dr. Annett criticizes my hypothesis on the grounds that it was based: (1) on want of knowledge of the development of the trophoblast and placenta; (2) on the conception of an ontogenetic and functional relation that does not exist; (3) on an idea of the nature of cancer which does not coincide with certain recent heterodox views of continental workers, which he supports.

With regard to the first, it is hard to believe that any teacher of embryology or obstetrics is so devoid of all knowledge of the development and nature of the trophoblast in the higher mammals as Dr. Annett seems to imply. I am quite sure my own students could always have given correct information about the subject, for it was clearly explained to them in my lectures with lantern illustrations. Moreover, all scientific books on obstetrics illustrate and explain the processes concerned. But Dr. Annett, being neither an obstetrician nor an embryologist, has, I suppose, been misled by the admittedly somewhat irregular terminology which has been employed at different times. One might leave the matter there; but this would be unfair to those who have forgotten their embryology and are ready to accept Dr. Annett's remarks at their face value, and he himself claims that they dispose of my hypothesis. I will try to be brief.

Prior to the work of Marchant and others (1895) chorion-epithelioma was supposed to be a deciduoma—sarcoma—arising in the maternal tissues. When it was recognized that this development originated from the epithelium of the chorion (foetal membrane) it was described as an epithelioma of foetal or embryonal tissues, the terms foetal and embryonal being then used, as now, in contradistinction to maternal. Moreover, the chorion-epithelium was described as the ectoblastic shell. It was a pity, of course, that no one at that time thought of describing the trophoblast as zygotic, in the sense of the early stages of segmentation; for it was, and still sometimes is, called "primitive ectoderm." "Zygotic ectoderm" would have made its nature clearer. Even so, the term "ectoderm" is probably confusing to the uninformed; but I cannot imagine that anyone having the slightest knowledge of the subject would ever think the term implied that the trophoblast (chorionic epithelium) is derived from the somatic ectoderm of the embryo, which, as everyone knows, is of later formation. It may, however, have the same segmentational origin.

In this connexion Dr. Annett's assertion that it has been "completely demonstrated" that the trophoblastic parent cell is separated from the other half of the zygote at the first segmentation division is, I believe, unjustifiable. Such a thing has not been demonstrated in placental mammals. It is, indeed, much more likely that the first segmentation division separates the primitive sex cell from the embryonic (somatic and trophoblastic) moiety; and this is the view which is generally held.

Secondly, having disposed, as he wrongly thinks, of the morphological aspect of my thesis, Dr. Annett proceeds to state that there is therefore no functional sequel—that is, there is no reciprocal growth-relation between the trophoblast and embryo—and that in consequence Mr. Biggs's question (which I asked, and to which I suggested an answer in 1909)—namely, "What is it that controls the activity of the chorion-epithelium after implantation of the fertilized ovum in the uterus is completed?"—has no point. But there is, I maintain, not only a very close relation, but also much point in this relation. It must not be forgotten that the trophoblastic placenta, which reaches its highest form in man, is an evolutionary development in mammals which replaces the yolk-sac of lower vertebrates: indeed, this strictly embryonal entodermal structure (yolk-sac) forms and functions as a placenta in certain mammals (marsupials), some of which have an allantoic placenta as well. The trophoblast, the yolk-sac, and the soma of the embryo are all developed from the same fertilized ovum (zygote), with all its potentialities, and each is dependent on the other in important respects, the most significant of which from the point of view under discussion is that the embryo within a short time establishes vascular connexions between itself and the trophoblast. It is then that the malignant, invasive functions of the chorionic epithelium cease—probably, as I answered my original question, because of some hormone in the blood stream of the embryo. All this has been published many times.

I cannot here discuss the phenomenon of dedifferentiation associated with malignant disease further than to say that the trophoblast, however early developed, is a functional organ of the embryo, and every cell of the latter is ontogenetically connected therewith and dependent thereon. There is nothing to disprove the possibility of the inner cells of the blastula or morula taking on trophoblastic formation and functions if the outer cells disappear or could be experimentally removed. Hence I see no reason to doubt that the trophoblast is the ultimate morphological and functional type to which somatic cells may tend to revert when malignancy supervenes.

Lastly, the view that cancer does not occur as the result of disordered conditions of somatic cells is open to many serious objections, one of which must strike everyone—namely, if this does not happen, how is it that cancer resembles the tissue in which it arises? I would further suggest that if Dr. Annett will make a careful study of ovarian neoplasms he will obtain much food for thought concerning intermediate or transi-

tional morphological states (and related functional activities) in regard to the cancer cell—conditions which he denies because they are at present beyond his experience.

Your readers will appreciate that it is difficult adequately to deal in a letter of moderate length with such wide and even general aspects of biology as those which are exposed in almost every consideration of views on the cancer problem.—I am, etc.,

Eardiston, Sept. 12th. W. BLAIR-BELL.

Circumcision

SIR,—Your correspondent Dr. R. Ainsworth (*Journal*, September 7th, p. 472) has apparently overlooked one important and well-known fact when he writes that "circumcision is, and always was, a tribal rite, and has no place in surgery," namely, the occurrence of carcinoma of the penis in the uncircumcised, and the extreme rarity of its occurrence—if ever at all—in those who have been circumcised.—I am, etc.,

London, S.W., Sept. 9th. M. M. POSEL, M.D., M.R.C.P.

SIR,—In India, where I practised for over twenty years, no Hindu is ever circumcised; it is the mark of the Mohammedan. (In the Moplah rising the Mohammedans forcibly circumcised Hindus who fell into their hands.) Imagine the reception a European doctor would meet with who practised it on all and sundry! This being so, what was to be done with Hindu infants who, having phimosis, had developed rupture due to straining? I asked a well-known Brahmin doctor with a large practice in the Punjab—R. B. Dr. Balkishan Kaul of Lahore. He said that, whatever the difficulty, circumcision could never be done on a Hindu infant, but that he had never found it necessary. All that was needed was to roll the prepuce sideways between finger and thumb, which broke down any adhesions, and then to push it back over the glans. The method was the same as that practised by Indian dais (midwives) when drawing milk from a woman's breasts. The nipple is gently rolled between finger and thumb. It is then easy to milk out any coagulum.—I am, etc.,

London, W.1, Sept. 14th. KATHLEEN VAUGHAN.

SIR,—Divergent views having been expressed on this subject in recent issues of the *Journal*, may I attempt to sum up and clarify the position?

Dr. McAuley's letter raises the point which is the crux of the matter: Should the prepuce be removed whether phimosis is present or not? I suggest that phimosis, especially if extreme, demands circumcision for these reasons. (1) Many infants so affected cry excessively until the operation is done: thereby (2) they may develop hernia. (3) Various troubles—for example, nocturnal enuresis, "fits," and, in later life, epithelioma of the glans and paraphimosis—are associated with phimosis. (4) In patients with phimosis suffering from gonorrhoea, complications arise, and treatment is more difficult than in the circumcised. (5) The disadvantages in the event of marriage are obvious. Although difficult of proof, there is little doubt that the presence of the prepuce, especially a long one, renders boys more likely to acquire the habit of masturbation. For this very good reason alone I think circumcision advisable, phimosis apart. If the reasons given for circumcision are sound, then "stretching" operations find no place.

I venture to describe the method I use, as it is not the orthodox one. It is well to wait until the infant is 2 to 3 weeks old, and feeding is well established.

Local anaesthesia is *always* used, novutox or locosthetic (P. D. and Co.), about 1/2 c.cm., being injected with a fine needle at the root of the penis on the dorsum and below at the peno-scrotal junction. This makes the operation entirely painless, as I have repeatedly proved. After thorough sterilizing of all the parts with spirit and biniodide solution, the end of the prepuce is seized on the dorsum on each side of the middle line with small narrow-bladed Spencer Wells forceps. Traction on these puts the prepuce on the stretch. A similar forceps is then passed down under the prepuce (dorsally), and opened widely, stretching the prepuce and freeing it from the glans, right down to the neck of the latter. The blade of a pair of straight blunt-pointed scissors is then passed under the prepuce and the latter slit down dorsally to the neck of the glans. The prepuce is then separated, if necessary, from the glans on each side, and cut away, beginning at the fraenum and ending on the dorsum. The cutting is carried round close to the neck of the glans, leaving *just* enough skin and mucous membrane to be stitched together. During these various manœuvres traction is made on the forceps originally applied, so as to steady and stretch the prepuce. Often no vessels need tying—at the most one on the dorsum and one in the fraenum. The free edges of the skin and mucous membrane are united by a few sutures of fine iodized catgut, using a small half-circle Hagedorn needle. A narrow strip of sterile gauze is wrapped round and tied on. The operation takes very little longer than the usual one, and the skin edge left is almost a perfect "circle"; any "after-trimming" of the edges is rarely necessary.

The advantages of this method are two: (1) there is no *possible* risk of injury to the glans; and (2) seeing exactly what one is doing, it is possible to remove the *whole* of the prepuce, which is the main point. Results are entirely satisfactory, and in my experience shock, sepsis, haemorrhage, etc., are unknown. Stitches absorb or work out, and healing is complete in five to ten days.

I hope I have shown, in reply to the flagrant statements of one of your correspondents (*Journal*, September 7th), that circumcision is not a "horrible mutilation," that it "has a sanitary and therapeutic value," and, being ordained by Providence from very early times (doubtless for good reasons), it is *not* a "cool assumption" on the part of surgeons doing this operation that they "know better how little boys should be made." And if phimosis is to be relegated to the list of "imaginary" diseases, why not make a clean sweep, and say that cancer, tuberculosis, and the rest do not exist?—I am, etc.,

Wakefield, Sept. 10th. G. W. THOMAS.

SIR,—This subject, like the big gooseberry, seems to crop up every few years, but nothing very fresh has so far been said on either side, and too often arguments are built up on irrelevant facts or theories. An example of this is given by Dr. R. Ainsworth (*Journal*, September 7th, p. 472): "Circumcision was and is a tribal rite"; *ergo*, there is nothing more to be said in its favour. But was not fire itself at first an object of savage worship—yet we do not discard our kitchen stoves? Again, the argument is brought up that the prepuce "being a work of providence [with a small "p," however], must be perfect." This strange argument would seem to abolish all evolution from the present-day perfection of everything, and one wonders was the five-toed horse perfect in its day, and, if so, why was our one-toed animal evolved?

But these are side issues. The crux of the whole matter is: Does removal of the prepuce lessen the incidence of syphilis? If this can be answered in the affirmative—and surely the Jewish practice can provide statistics to settle it—then circumcision is surely a duty in all cases.—I am, etc.,

Elgin, Sept. 9th. "F. G."

Treatment of Puerperal Streptococcal Septicaemia

SIR,—Dr. Naughten's report (*Journal*, September 7th, p. 477) of a case of scarlatina occurring coincidently with a case of puerperal septicaemia is decidedly interesting. Its interest appears to me to lie not in the fact of the occurrence in association of the two diseases, but rather in that the puerperal septicaemia occurred first, and probably gave rise to scarlet fever in the child, who was in close association with the mother.

The associations and interrelations of erysipelas, septic throat, surgical infections, puerperal sepsis, and scarlet fever have long been recognized, and there are numerous examples in the literature. Frequently cases have been reported where septic sore throat and scarlet fever have been associated in the same house with puerperal sepsis in a lying-in woman. Dr. Naughten's two cases raise again the question of the specificity of the scarlet fever streptococcus. The vexed question of the immunological grouping of the streptococci is not yet settled. The majority are, I believe, with the Dicks in their claims for specificity of *Streptococcus scarlatinae* and its four groups, but McLaughlan and Mackie (1928) denied the existence of a specific scarlatinal group, and Dr. Naughten's report would lend support to their attitude. His failure to get any result with scarlet fever antitoxic serum is just what one expects. Its value is confined to very early use, and perhaps only as a prophylactic.

The routine ante-natal Dick-testing, suggested by Dr. ffolliott and approved by Dr. Naughten, has been tried before by many notable workers—for example, Salmond, Turner, Kunz, and Nobel. The only point to note about its undoubted value is that one could not rely on all the negative Dick results. It was rather a pity that Dr. Naughten did not secure swabs from the puerperal case—say, uterine swabs from the woman, and throat swabs and blood specimens from both cases. It would then be seen whether the causal agent was a Dick streptococcus or another one of the haemolytic group. It would be interesting to discover about the health of the throats of those in close association with these cases, and also if there were any haemolytic streptococci in the milk supply to the house.

As well as bringing forward the value of Dick-testing ante-natally, this tragic case stresses the necessity for routine use of gloves, the use of dettol, and the careful avoidance of the association with an obstetric case of anyone suffering from these associated haemolytic streptococcal conditions, whether this association be a medical, nursing, familial, or attendant one.

Finally, this case brings prominently to the general practitioner's mind the group which has been called in America "the Borderlands of scarlet fever," and comprises septic surgical infections, puerperal sepsis, septic sore throat, and erysipelas.—I am, etc.,

Dublin, Sept. 8th. GERARD COYNE.

Whooping-cough Infections from Schools

SIR,—Schools have a definite and very laudable policy of expecting a very stringent statement as to exposure to infection of any child before returning to school. Unfortunately, I have twice lately experienced the effects of what may be called a contrary policy.

A boarder, placed in quarantine for three days with doubtful whooping-cough—no test taken—was sent to a children's holiday home, with the result that seventeen others went down with the illness. This week I was expecting a visitor. On the day of the expected arrival I received news that the lady had whooped during the night; a test was to be taken, which proved positive, and the visit was cancelled. The infection was traced to a child who, with definite whooping-cough, was sent direct from school, without any warning, to the house of another child, to whom it conveyed the infection, this child conveying it to my visitor.

Sauce for the goose is sauce for the gander. I cannot but feel that restrictions placed on parents and guardians should not be ruthlessly ignored by school authorities.—I am, etc.,

September 9th. "DISGUSTED."

Hydrogen Peroxide in Ear Disease

SIR,—The persistent and futile popularity of peroxide of hydrogen as a local application for the discharging ear has often been a source of wonder to me (and to many of my colleagues), and it is obvious that this will continue unless someone ventures to protest. The frequency of its prescription is perhaps due to the illusion that being of a watery nature it can at least do no harm, and the fizzing sound of the drops lulls contentment into the patient because "something is happening." It is certainly manifest to most aurists that its popularity is not earned by its therapeutic triumphs.

I maintain very strongly—and if it starts an argument so much the better—that "peroxide" is useless and in many cases harmful for the discharging ear. This condemnation is based on the fact that the mucosa of the tympanic cavity is particularly averse to water; and what is hydrogen peroxide but water charged with a few bubbles of oxygen? Furthermore, quite a proportion of discharging ears are due to dermatitis or "eczema" of the meatal walls, again a condition which dermatologists will admit is often intolerant of water. Quite frequently, on top of this, and adding insult to injury, comes the ubiquitous plug of cotton-wool maintaining a warm, perfectly sodden mess in the deep meatus and tympanum as a splendid breeding-ground for all and sundry micro-organisms.

What hope there is in such circumstances of securing a dry ear is beyond scientific comprehension.—I am, etc.,

Liverpool, Sept. 9th. JOHN ROBERTS.

Shifting Sands of the Architecture of Medicine

SIR,—The use of the term "homoeopathic" in a sectarian sense is deplored by none more deeply than by homoeopaths themselves. It should, however, in common fairness be recognized that such use is not the fault of homoeopaths, but is the inevitable result of the unscientific attitude adopted towards homoeopathy by the profession generally. The whole history of homoeopathy shows that its adherents have been continually striving to have their principles examined and tested scientifically, whereas the orthodox majority, with no practical and little or no theoretical knowledge of the subject, has persisted in regarding them as a set of ignorant quacks to be studiously ignored and—more especially in the past—definitely ostracized.

Such an attitude was understandable in the early days of homoeopathy, when its conceptions were so much in advance of the science of the time. Now that these conceptions have been completely verified by modern science it is less comprehensible, and can only be explained by the persistence of prejudice preventing the many from acquainting themselves with the facts. When the scientific foundation of homoeopathy is generally realized the sectarian use of the adjective will automatically cease. It is not due to any emphasis of superiority by homoeopaths, but to the superior aloofness of their allopathic colleagues.—I am, etc.,

St. Annes-on-Sea, Sept. 10th. G. RUTHVEN MITCHELL.

Obituary

CHARLES ARTHUR BRIGSTOCKE, M.R.C.S.

We regret to record the death on August 25th, at the age of 92, of Dr. C. A. Brigstocke of Haverfordwest, Pembrokeshire. A native of Carmarthenshire, Dr. Brigstocke qualified M.R.C.S. and L.S.A. in 1865, having received his medical education at St. Bartholomew's Hospital. He joined the B.M.A. four years later. After acting as resident medical officer of the Carmarthenshire Infirmary he practised at Llanelly, where he was assistant medical officer to the tinplate workers. It was during this period that he played such a notable part in stamping out the cholera outbreak of 1866. He worked day and night for weeks, and when later he left the district he was presented with a testimonial by the townspeople. In 1874 he went to practise in Cardigan, where he stayed for six years, and held the position of deputy coroner for South Cardiganshire. Eventually he settled in Haverfordwest, where he held the post of medical officer of health for forty-three years. He was a very popular figure in this borough and the neighbouring villages.

Dr. OSCAR WILLIAMS, chairman of the South-West Wales Division of the B.M.A., writes:

Dr. Brigstocke was a remarkable old gentleman in many ways. Possessing wonderful vitality, he continued to practise until he was 87 years of age, only retiring in January, 1930—in fact, for two years afterwards he continued to discharge the duties of borough medical officer of health. He was a fine example of the old family doctor, top-hatted and frock-coated. Quickly winning the confidence of his patients by his competence, it was not long before he had built up an extensive practice and acquired the reputation of being an able obstetrician. He was a firm believer in the simple life, and, while keeping abreast with the advances in medical science and surgery, he still reposed his greatest faith in the efficacy of abstemiousness.

As medical officer he held strong views on public health questions, and was largely responsible for many of the improvements in Haverfordwest's water, sanitary, and other services. We can fairly say that he was a pillar of the British Medical Association in West Wales; he was president of the South Wales and Monmouthshire Branch in 1924–5. To the younger medical men who commenced practice after the war Dr. Brigstocke's fine figure, his dress so typical of what we thought the best type of family practitioner's should be, was an inspiration and a model, while his addresses as chairman and his advice in council were of the utmost value to the Division as a whole and to each single member individually. His reminiscences of midwifery in the days before midwives, of surgery before the days of antiseptics, and of fighting the scourges of cholera and other epidemics, now fortunately almost unknown in this country, were a revelation to all practitioners who could not possibly have known any such conditions. He continued to attend meetings until three years ago, although each journey meant travelling 40 miles either way, and when at last he felt compelled to resign his membership of the Association it was unanimously decided to make him an honorary member of the Division and Branch of which he was the oldest and in many ways the most distinguished member.

Amongst other things, Dr. Brigstocke was a Fellow of the Institute of Public Health, and held the post of president of the South Wales and Monmouthshire Medical Association. For many years he represented the medical practitioners on the County Insurance Committee, passing through the Chair. A keen geologist, he had a wonderful collection of specimens from all parts of the world. He was the author of a paper on asiatic cholera, which he wrote following his experiences at Llanelly, and among his other medical literary contributions was an article on haemophilia. Dr. Brigstocke never courted publicity, but he was always ready to express his views on matters of health. His was for generations a familiar and beloved figure in Haverfordwest, and the older people especially will share in the sorrow which his death has caused.

HUGH WILLIAM ACTON, C.I.E., M.R.C.S.

Lieut.-Colonel I.M.S. (ret.)

We regret to announce the death on August 23rd, and only fifteen days after his retirement, of Lieut.-Colonel H. W. Acton. Born in Calcutta in 1883, he was educated at Gravesend, Bedford, and the Middlesex Hospital. He qualified M.R.C.S., L.R.C.P., in 1905, and before entering the Indian Medical Service in 1907 held the posts of house-physician at the Middlesex and clinical assistant at the Chelsea Hospital for Women.

On enrolment he was drafted to the Frontier as medical officer of the 53rd Sikhs at Peshawar, and it was not until 1910 that he became assistant director of the Pasteur Institute at Kasauli, which was at that time the centre for antirabic treatment in India. He held this post until 1916, when he was recalled to military duty and sent to Mesopotamia. He served with the Mediterranean forces for nearly five years, and was mentioned in dispatches in 1919. Two years later, with the rank of major, he was appointed to the chair of tropical pathology and bacteriology in the newly founded School of Tropical Medicine at Calcutta. In this post he showed great ability, and during the succeeding twelve years proved his versatility by acting as professor of helminthology, taking charge of the department of dermatology, and on several occasions acting as director and head of the school, besides being in charge of the Carmichael Hospital for Tropical Diseases. He was sent back to England on sick leave in 1933.

In his capacity as teacher Colonel Acton showed great clarity of mind, and held the attention of those whom he set out to instruct. His abilities extended beyond teaching to administration, while in medical research his active and inquiring mind was always ready to grasp the essentials of any problem with which he was faced. Amongst many other studies he investigated the action of the cinchona alkaloids on malarial parasites; the relation in these alkaloids of chemical formula to optical and therapeutic activity; and the cause of the toxic effects of quinine administered intravenously and intramuscularly. In 1928 he published, in conjunction with Lieut.-Colonel R. Knowles, his book *On the Dysenteries of India*.

In recent times his theory of entamoeba carriers was the subject of an interesting discussion at the Royal Society of Tropical Medicine. Other subjects of investigation included snake venom, lathyrism, epidemic dropsy, and many aspects of protozoology.

Colonel Acton's death has come as a great blow to a wide circle of friends and colleagues. He is survived by a widow and two sons.

We regret to announce the death on September 1st of Dr. JAMES REID of St. Helens, Lancs. Dr. Reid, who was in his eighty-first year, was a native of the Orkneys and was born at Kirkwall, where his father was Provost and one of the chief shipping merchants. He qualified M.B., C.M. at Edinburgh in 1879 and went to St. Helens the next year as assistant to Drs. Twyford and Jameson, afterwards becoming a partner. Here he worked in practice until 1928, when he retired to live at Bognor Regis. For close on forty years he had acted as the St. Helens police surgeon, and his excellent work for the

St. Helens Hospital will be affectionately remembered. He was a keen athlete, and took a considerable interest in the local cricket, tennis, and golf clubs. In 1903 he was made a borough magistrate, and served on the Bench for a number of years. He leaves two sons, one a medical man, and two daughters.

The Services

COMMISSIONS IN THE ROYAL ARMY MEDICAL CORPS

The War Office announces that applications are invited from medical men for appointment to commissions in the Royal Army Medical Corps. Candidates will be selected for commissions without competitive examination, and will be required to present themselves in London for interview and physical examination on or about October 23rd, 1935. They must be registered under the Medical Acts, and normally must not be over the age of 28 years. Successful candidates will in the first instance be given short service commissions for five years, at the end of which period they may either retire with a gratuity of £1,000 or apply for a permanent commission. Permanent commissions will be given to officers selected from among those who wish to make the Army their career. Full particulars of the conditions of service and emoluments, also forms of application, may be obtained by applying, either by letter or in person, to the Assistant Director-General, Army Medical Services, War Office, London, S.W.1.

OXYGEN TENT APPARATUS

A PROPOSED SERVICE FOR LONDON

We have received a copy of the following letter which has been sent to London teaching hospitals by Sir Arthur Stanley, Chairman of the Executive Committee of the British Red Cross Society. An article by Dr. E. P. Poulton on the oxygen tent appeared in the *Lancet* of February 4th, 1933, and Dr. Poulton demonstrated the apparatus to the Section of Medicine at the Annual Meeting of the B.M.A. at Bournemouth in 1934. The value of the oxygen tent in a severe case of bronchopneumonia following whooping-cough was the subject of an article in the *Journal* of August 17th, 1935 (p. 292).

Sir,—The British Red Cross Society has received the following memorandum:

"We who have signed this letter are convinced that the oxygen tent provides the most efficient means of administering oxygen so far devised, and is of great value in a number of medical and surgical conditions. We should welcome any steps to make the method more readily available in hospitals and in the patient's own home. We believe that any help the British Red Cross Society can give in this connexion will be for the public welfare."

The signatories and the teaching hospitals to which they are attached are:

Lord Dawson (London), Lord Horder (St. Bartholomew's), Sir Thomas Dunhill (St. Bartholomew's), Dr. G. E. Beaumont (Middlesex), Mr. A. Tudor Edwards (Westminster), Dr. Douglas Firth (King's), Professor Francis R. Fraser (Post-Graduate Medical School, Hammersmith), Dr. Reginald Hilton (St. Thomas's), Dr. Gordon Holmes (Charing Cross), Dr. Arthur F. Hurst (Guy's), Mr. Cecil A. Joll (Royal Free), Dr. Reginald Miller (St. Mary's), Dr. Wilfred J. Pearson (University College Hospital), Dr. E. P. Poulton (Guy's), Dr. James Torrens (St. George's), Dr. R. A. Young (Middlesex).

In response to these representations the British Red Cross Society has decided to co-operate in the establishment of a National Oxygen Tent Service should it be found that there is need for such a service. It is clear, however, that more definite data than practical experience has so far rendered available are necessary for the consideration of a scheme which would involve considerable expense. This evidence can only be secured by actual hospital experience over a reasonable period of time, and, in pursuance of our desire to obtain this evidence, we have placed an order for the construction of twelve sets of apparatus. When these are completed—which we hope will be before the end of October—we propose to place one at the disposal of each of the hospitals to which the several signatories are attached. The initial cost of these will be met out of the funds of this Society.

Will you kindly inform me if your hospital would be willing to accept one of these tents for a trial, which we suggest should be carried out for a period of not less than two months. If you will assist us in this way by keeping comprehensive records of cases we should much appreciate a report from you at the end of the period on the value and desirability of a National Service. If at the end of the trial your hospital wishes to acquire the apparatus we would ask you to refund the actual cost of the tent to the Society.

As some instruction is desirable as to the operation of the apparatus, a demonstration model will be at this address, and available to your staff, by appointment, from October 1st. In the meantime we would appreciate any suggestions which may occur to you, and also should be glad if you would afford information to other hospitals, nursing homes, and similar institutions. It is possible that some inquiries with regard to the tent may reach you with which you do not feel competent to deal. In such cases we should be glad if you would send or refer such inquiries to this office.—I am, Yours faithfully,

ARTHUR STANLEY.

British Red Cross Society,
14, Grosvenor Crescent, London, S.W.1.

Medical News

The Chesterfield Lectures, constituting a systematic course in dermatology, will be given at the London School of Dermatology (St. John's Hospital for Diseases of the Skin, Leicester Square, W.C.) during October and November, 1935, and January and February, 1936. An examination will be held in March, when the Chesterfield Medal will be awarded to the best candidate, provided the required standard is reached, and an intensive course will be held in May. Clinics will be held daily in the out-patient department at 2 p.m. and 6 p.m. (Mondays to Fridays) and 2 p.m. (Saturdays). The fee for hospital practice, including lectures, is £1 1s. a month. Medical practitioners will be welcome as occasional visitors on presentation of their cards. Further particulars may be obtained from the dean or the secretary at the hospital.

The Fellowship of Medicine (1, Wimpole Street, W.) announces the following courses: chest diseases, at Brompton Hospital, September 23rd to 28th; dermatology, at St. John's Hospital, September 30th to October 31st, afternoons; proctology, at Gordon Hospital, September 30th to October 5th; cardiology, at National Hospital for Diseases of the Heart, October 7th to 18th; medicine and surgery, at Metropolitan Hospital, October 7th to 19th; anatomy and physiology course for the Primary F.R.C.S., in Infants Hospital lecture hall, Monday, Wednesday, and Friday evenings, October 7th to November 29th. Special concentrated week-end courses, especially suitable for general practitioners, will be given as follows: ophthalmology, at Royal Westminster Ophthalmic Hospital, all day Saturday and Sunday, September 28th and 29th; fevers, at Park Hospital, all day Saturday and Sunday, October 5th and 6th (also suitable for M.R.C.P. candidates); heart and lung diseases, at Royal Chest Hospital, all day Saturday and Sunday, October 12th and 13th; obstetrics, at City of London Maternity Hospital, all day Saturday and Sunday, October 19th and 20th. Lectures and lecture-demonstrations will be given as follows: *x*-ray interpretation, at Medical Society of London, Chandos Street, W., September 30th to October 4th, at 5 p.m.; endocrinology, at National Temperance Hospital, Tuesdays and Thursdays, October 8th to 24th, at 8.30 p.m.; gynaecology, at Medical Society of London, Thursdays, October 10th to November 7th, at 4 p.m. Courses, etc., are open only to members.

St. Mary's Hospital, W., announces a post-graduate course to be held in the library of the new medical school and in the lecture theatre of the Pathological Institute from Friday, September 27th, to Sunday, September 29th, inclusive, at 10.15 a.m. daily. The course is open to all medical practitioners without fee.

Two courses of lectures and demonstrations on anti-gas precautions and first aid for air-raid casualties will be held at the County of London Red Cross Headquarters (9, Chesham Street, S.W.) on Fridays at 2.30 and 8 p.m., commencing on October 4th. The lectures are open to the public, so far as accommodation will permit, and the fee for the course is 7s. 6d. Permits to attend the lectures will be issued to those who send in their names and addresses, together with the fee, not later than September 28th, to the county secretary at the above address.

An international post-graduate course on gout and rheumatism will be held at Radiumbad Brambrach from October 4th to 7th, under the direction of Professor Gudzent of Berlin.

The Duke of York, having agreed to accept the Presidency of King's College Hospital, S.E., the Duke of Connaught, who has held the post of President for nearly thirty-two years, is resigning in his favour.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

The **TELEGRAPHIC ADDRESSES** are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Wintering in the Channel Islands

"E. F. D." requires information *re* suitability, accommodation, cost, etc., for a case of chronic pulmonary tuberculosis wintering in Jersey or Guernsey. The patient is a male, in fair condition, ambulant, but with very slowly progressive disease.

*** We are indebted to Dr. R. FORTESCUE FOX for the following answer to our correspondent's inquiry. "The Channel Islands, with many English seaside resorts in the south-west and north-west, possess a similar type of climate, with important variations both in the localities and in the wintry months taken separately. This type of winter climate may be recommended for middle-aged and elderly patients, especially those showing bronchial irritation. In the choice of locality special regard should be had to aspect, subsoil, freedom from fogs, and especially shelter from strong winds. For this reason the Channel Islands, which make a good winter retreat, are not to be recommended for tuberculous cases in the spring months. A useful criterion for these cases is the character of the 'invalids' day'—that is, 9 a.m. to 5 p.m. (see *Handbook of the British Health Resorts Association*, 1935). In places—and they are not uncommon on the south-west and north-west coast—where a large proportion of this daylight period can be spent pleasantly and safely in the open air, cases can be expected to do well. Only private accommodation for patients is available in Guernsey and Jersey. Inquiries may, however, be addressed to the Victoria Hospital, Guernsey, and the Jersey Dispensary and Infirmary."

Frequency of Micturition

"A. B." (Pietermaritzburg, Natal), in reply to "N. B. S." (*Journal*, July 27th, p. 194), who inquired for a successful remedy for this condition in an elderly lady apparently free from organic disease, writes: I have had repeated success in my own family from the use of freshly prepared linseed tea, a cupful being taken three or four times a day. It was recommended by friends in an obstinate case in one of my children, and I gave marked results. The incontinence ceased in a few days, but recurred several times if the child had a cold bath or sea-bathed. The treatment then caused it to cease, and it has not recurred now for some years. The treatment is simple, harmless, and surely worthy of extended trial.

Income Tax

Payment for Guaranteeing a Loan

"H. A. L." asks whether it is customary for such payments to be allowed.

*** We know of no case where such payments are allowed where the loan in question was obtained to purchase a practice or share in one. It seems analogous to guarantee premiums paid to secure debentures, and the accepted practice appears to be to refuse the deduction of such premiums.

LETTERS, NOTES, ETC.

Extrasystoles

Dr. C. S. FOSTER (London, S.W.1) writes: Having seen several cases of this complaint, I think it might help my fellow medical men to know of my experience. In all the cases the cause has apparently been due to mental strain. In one instance the attack came on only when the patient was shaving in the morning, preventing him shaving, and lasting until after breakfast. His age was 64, and he was a healthy man, though he had a great deal of worry in business, which produced considerable flatulence. He had no hobbies. Another case was that of a very keen business man, aged 65, who always exaggerated any trouble, and could not get it off his mind. He had attacks just before going to sleep, generally half an hour after getting into bed. He, too, had no hobby. Another case was that of a man who had had indigestion all his life (chief symptom flatulence), and who, after reaching the age of 60, had attacks when excessively worried, or when going longer without food than usual. The severity of the attack varied with the amount of fatigue. The final case was that of a keen business woman who, at the menopause, suddenly developed attacks about 3 a.m., with marked depression. All these cases responded to treatment, and none have had a return of the attacks. Gastric and nerve remedies were given, with strict attention to diet, but no remedies to produce sleep.

Too Many Doctors in the Argentine

Dr. Rafael Bullrich, dean of the Medical Faculty of Buenos Aires, in his address at the inauguration of the new session (*Semana Médica*, April 11th) states that the Argentine Republic, with a population of 12,000,000, has a yearly output from her medical schools of 600 new doctors, while Belgium, whose population is but slightly less, thinks that her output of 300 is too great. He calls for united action of the medical faculties of the Republic with the idea of limiting the number of entrants and raising and equalizing the standard of knowledge demanded from candidates for degrees in medicine and dentistry. Soviet Russia, he declares, in endeavouring to recruit the medical profession from the ranks of the manual worker, and in doing all in its power to prevent the doctor's son from following in his father's footsteps, is shamefully lowering the cultural level of the new race of doctor and is destroying tradition, which is one of the greatest forces in a nation's historical unity.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 39, 40, 41, 42, 43, 44, 45, 48, and 49 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 46 and 47.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 148.